



**AMBIRAD
VISION[®]
SCHOOL
HEATER KIT
INSTALLATION
MANUAL**

REVISED 04/08/2011

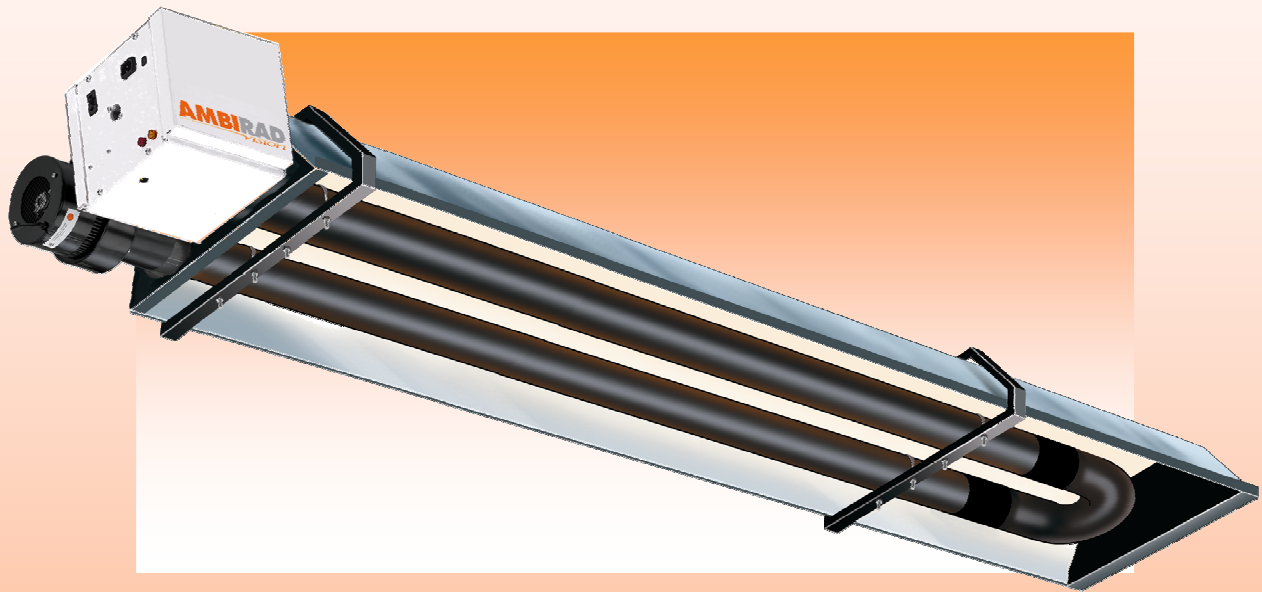
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ASSEMBLY, INSTALLATION & SERVICING MANUAL FOR AMBIRAD VISION® VS RANGE OF RADIANT TUBE HEATERS



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WARNINGS

- DO NOT PLACE ARTICLES ON OR AGAINST THIS APPLIANCE
- DO NOT USE OR STORE FLAMMABLE MATERIALS NEAR THIS APPLIANCE
- DO NOT SPRAY AEROSOLS IN THE VICINITY OF THIS APPLIANCE WHILE IT IS IN OPERATION
- CHECK WITH YOUR LOCAL SUPPLIER FOR DETAILS ABOUT SPECIFIC EQUIPMENT THAT HAS BEEN OMITTED OR MODIFIED

Introduction.

Welcome to the new range of high efficiency AmbiRad Vision radiant tube heaters. Local regulations may vary in the country of use and it is the installers responsibility to ensure that such regulations are satisfied

All installation, assembly, commissioning and service procedures must be carried out by suitable qualified competent persons to the statutory regulations in the country of use.

When assembling, installing, commissioning and servicing is undertaken on radiant tube heaters specified in these instructions, due care and attention is required to ensure that working

at height regulations are adhered to at the mounting heights specified.



PLEASE READ this document prior to installation to familiarise yourself with the components and tools you require at the various stages of assembly.

All Dimensions shown are in mm unless otherwise stated.

The manufacturer reserves the right to alter specifications without prior notice.

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1. Installation Requirements.



Isolate any electrical supply to the heater and controller before proceeding.

1.1 Health and Safety

AmbiRad heaters must be installed in accordance with these instructions, local gas fitting regulations, municipal building codes, electrical wiring regulations, AS/NZS 5601.1,

and any other relevant statutory regulations, as well as the requirements of the local gas or electricity authority. Due account should also be taken of any obligations arising under the current Occupational Health and Safety Act and other relevant codes of practice.

Isolate all electrical supplies to the heater & controller before proceeding.

For your own safety we recommend the use of safety boots and leather faced gloves when handling sharp or heavy items. The use of protective eye wear is also recommended.

1.2 Model Definitions

VSUT = AmbiRad Vision U Tube heater with painted induced burner, stainless steel reflector & end caps.

VSUH = AmbiRad Vision U Tube heater in Herringbone manifold configurations with painted induced burner, stainless steel reflector & end caps.

VSLE = AmbiRad Vision Single Linear heater with painted induced burner, stainless steel reflector & end caps.


VSLEF = AmbiRad Vision Single Linear heater with painted Forced burner, stainless steel reflector & end caps. (Nat Gas ONLY)

VSLEH = AmbiRad Vision Linear heater in Herringbone manifold configurations with painted induced burner, stainless steel reflector & end caps.

VSLEL = AmbiRad Vision Double Linear heater with painted induced burner, stainless steel reflector & end caps.

VSAUT, VSAUH, VSALI, VSALF, VSALH & VSADL = As above except: aluminised reflector with *no* end caps.

1.3 Heater Suspension

 See fig 1b. Attachment to the heater support lugs should be made by a 'speed link', D shackle or in the case of drop rods, a closed formed hook. The hanging attachments to overhead steelwork etc. must be purpose made to good sound engineering practice or of a proprietary type fixing. They must be adequately fixed and designed to carry the whole weight of the heater. In the event of suitable roof steelwork being unavailable, additional steelwork should be fitted to enable vertical hangers to be used for suspending the heaters.

Model	Recommended Mounting Height (m)	
	Horizontal	Inclined / wall mounted
15	4.0 - 5.0m	3.5 - 4.5m
25	5.0 - 8.0m	4.0 - 5.0m
35	6.0 - 10.0m	4.5 - 6.5m

These methods are illustrated in Figure 1.b. If there are any doubts as to the strength or suitability of roof steelwork to which heaters are to be suspended, please refer to a Consultant, Architect or owner of the building. The recommended mounting heights for AmbiRad heaters are given in the table above.

1.4 Wall Mounting

These radiant tube heaters can be wall mounted using the appropriate bracket (AmbiRad part no WMB-13-22-38).

When using the wall mounting brackets the heater must be inclined at an angle between 30° and 45°.

Table 1 Angle Mounting

Heater Size	Required angle	U Tube		Linear	
		Chain length	Eyebolt position	Chain length	Eyebolt position
15 - 25	30-35°	10 links	2	7 links	1
	45°	13 links	2	9 links	1
35	30-35°	12 links	3	8 links	1
	45°	16 links	3	10 links	1

Figure 1.a. Angle Mounting Using the Wall Mounting Bracket

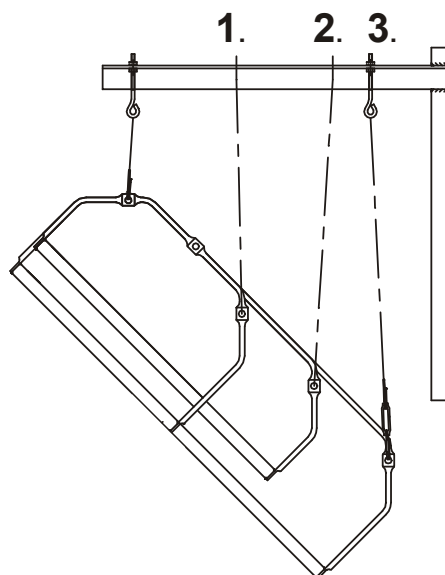
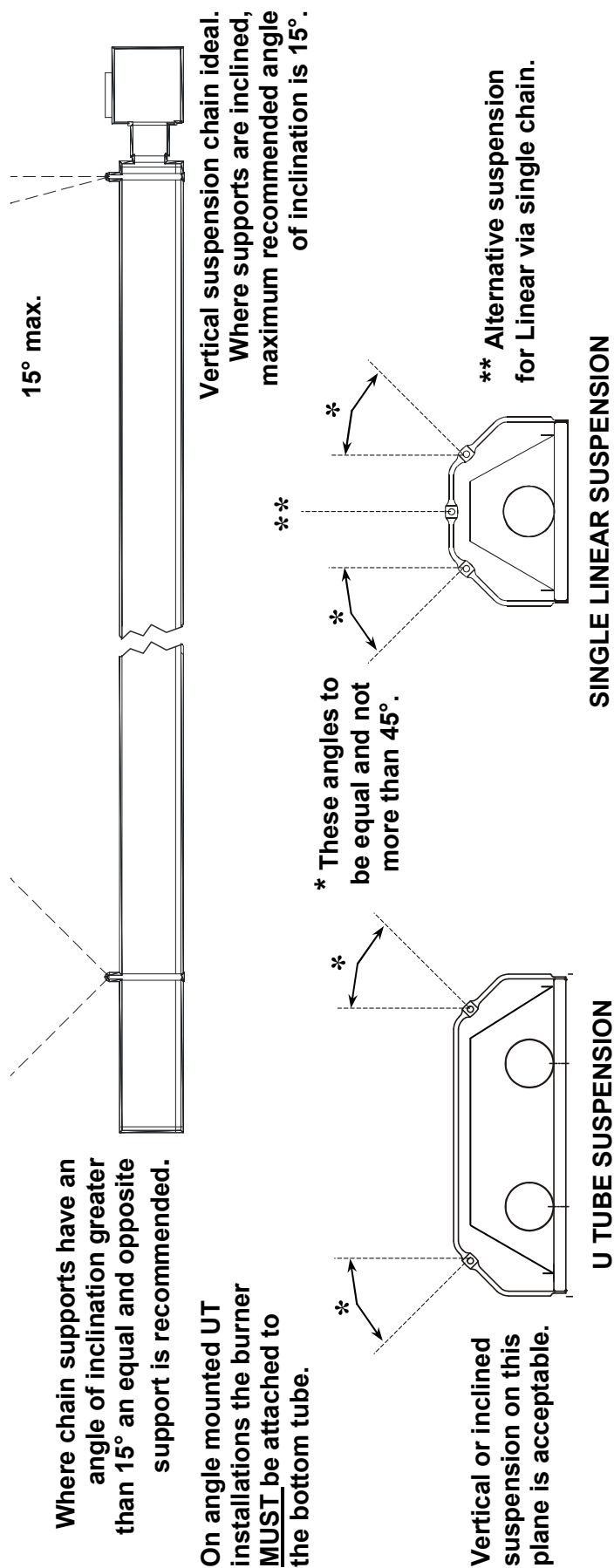
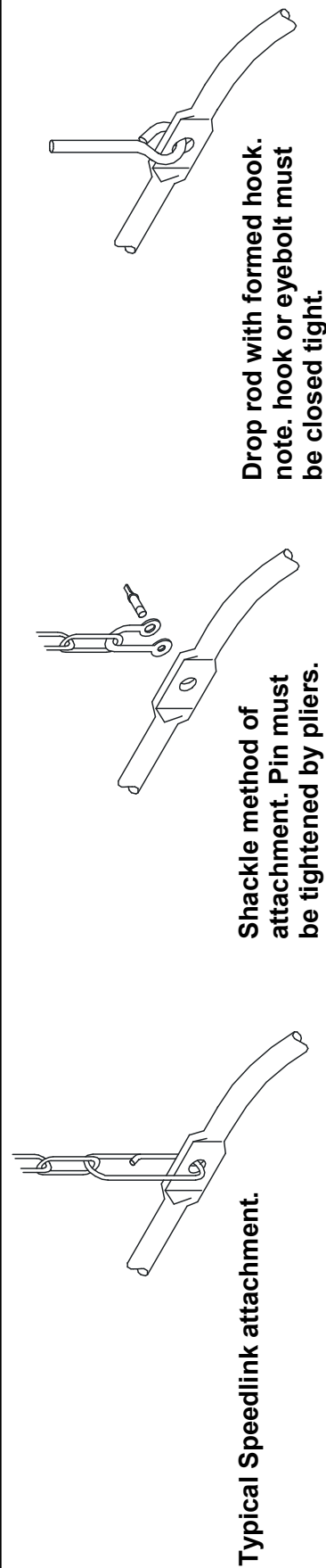


Figure 1.b. Recommended Methods of Heater Suspension.



ON U TUBE VARIANTS THE HEATER SHOULD SLOPE DOWNWARDS TOWARDS THE RETURN BEND AND ON LINEAR VARIANTS SHOULD SLOPE DOWNWARDS TOWARDS BURNER BY APPROX. 10mm FOR BOTH HORIZONTAL AND WALL MOUNTED INSTALLATIONS.




1.5 Herringbone systems (UH).

The manifold system should be arranged to fall slightly in the direction of the vacuum fan. This ensures that any condensation formed in the manifold on cold start and cool down is not trapped or allowed to drain back into the heater unit. This allows condensate to flow towards the condensate trap located at the vacuum fan end of the manifold system. (See figure 2a below for condensate trap arrangement).

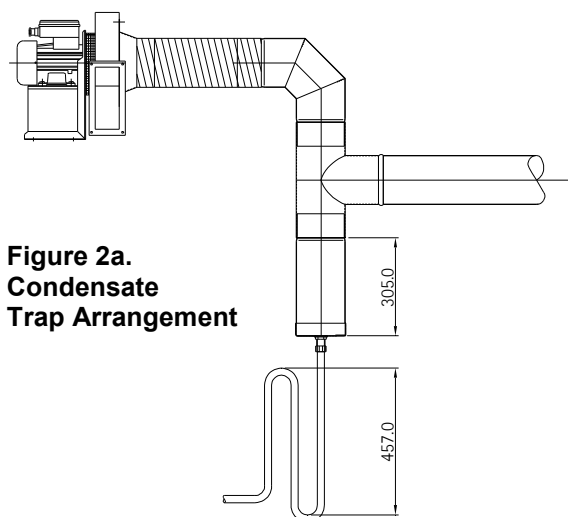
The manifold should be supported by chain, stainless steel flexible wire, or other flexible means from the roof structure to allow movement caused by thermal expansion. For 100mm diameter manifold the maximum distance between supports is 2.4m and 3.0m for 150mm diameter.

Flexible couplers (supplied by Saacke) must be inserted within the manifold system to allow linear expansion to take place and prevent stress and strain on the system.

 The manifold must be supported either side of the flexible coupler.

The exhaust flue should be adequately supported from the building structure and installed in accordance with AS/NZS 5601.1 to ensure ventilation requirements are satisfied.

A condensate trap assembly must be provided at the end of the manifold system before the hot gas vacuum fan.



**Figure 2a.
Condensate
Trap Arrangement**

The minimum depth of the condensate collecting chamber shall be 305mm and the minimum depth of the condensate drain pipe 'U' trap shall be 457mm deep. The end cap of the collecting chamber is to be fitted with a flush flanged tank connector. Any protrusion

should be removed leaving the inside flush with the end cap.

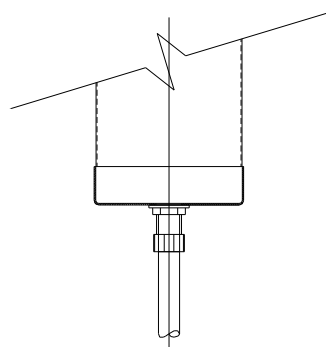


Figure 2b. Collecting Chamber Arrangement

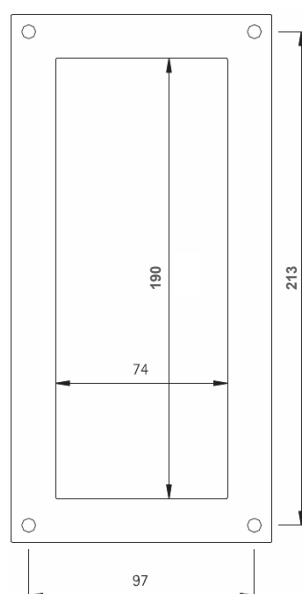
The end cap should be sealed with silicon jointing compound and pop riveted in position. All condensate drains from the flue collecting chamber to the disposal point shall be corrosion-resistant material of not less than 22mm internal diameter. Copper or copper based alloy shall not be used for condensation drains.

Condensate drain pipes must be protected against the effects of freezing.

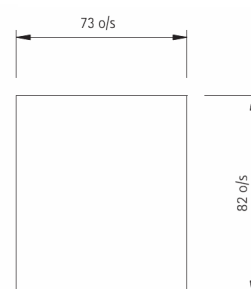
The Type '0' and Type '2' vacuum fans have bottom horizontal discharge with rectangular connections (flanged on the type 0) and must be mounted in that position by means of the fan support stool onto a suitable platform or brackets fixed to the building structure.

For details of the fan outlet fixing holes see below.

Figure 2c. Type 'O' Fan Outlet Dimensions



**Figure 2d.
Type 2 Fan
Outlet Dimensions**



For details of fan mounting bracket and fixing down holes see figure 3.

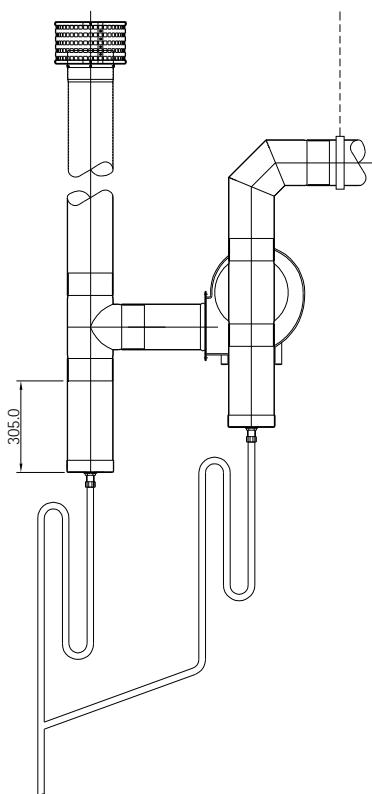


Figure 2e. Conventional Flue Arrangement Roof Exit.

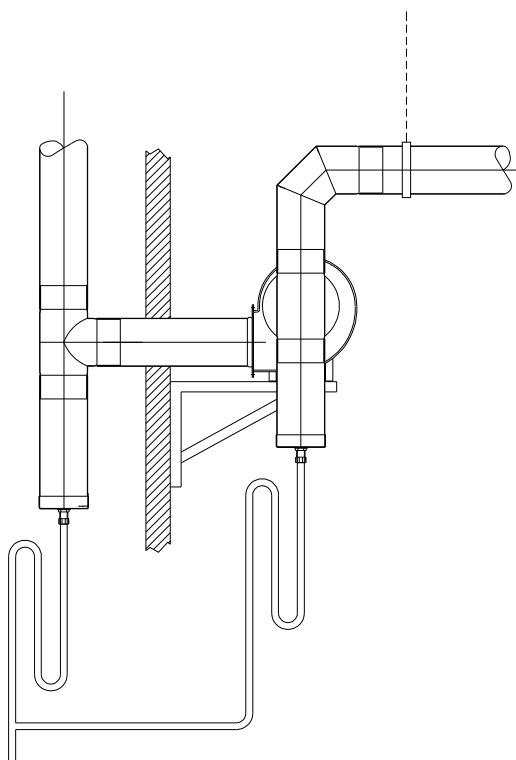


Figure 2f. Conventional Flue Arrangement Wall Exit.

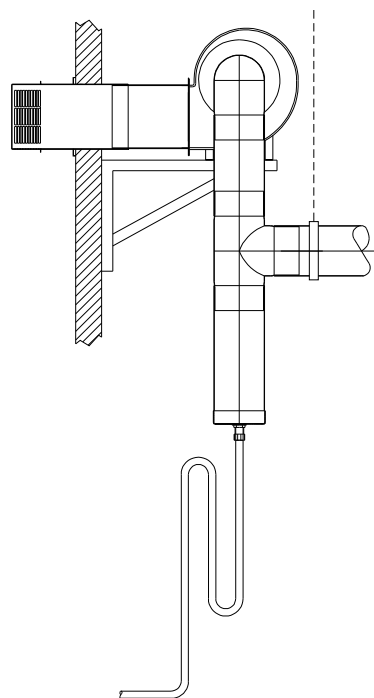


Figure 2g. Stainless Steel Telescopic Through The Wall Arrangement (available for Type 'O' and Type '2' fans)

Where a conventional flue is to be installed, AmbiRad supply an aluminium transformation piece to which a 150mm (6ins) diameter flue must be attached.

The length of flue which may be connected to the fan outlet must be adequately supported from the building structure.

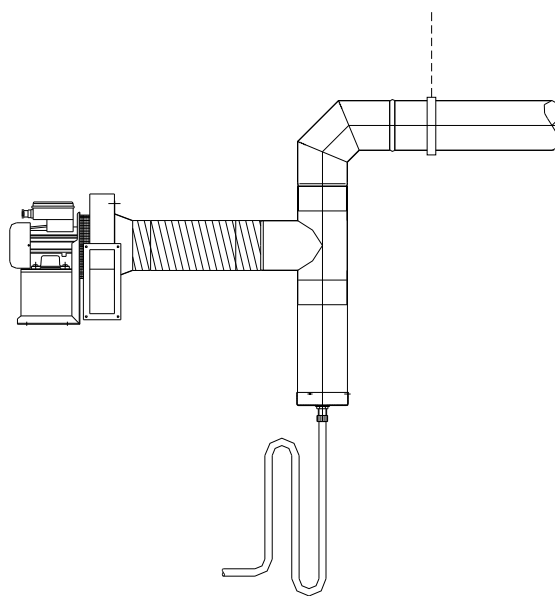
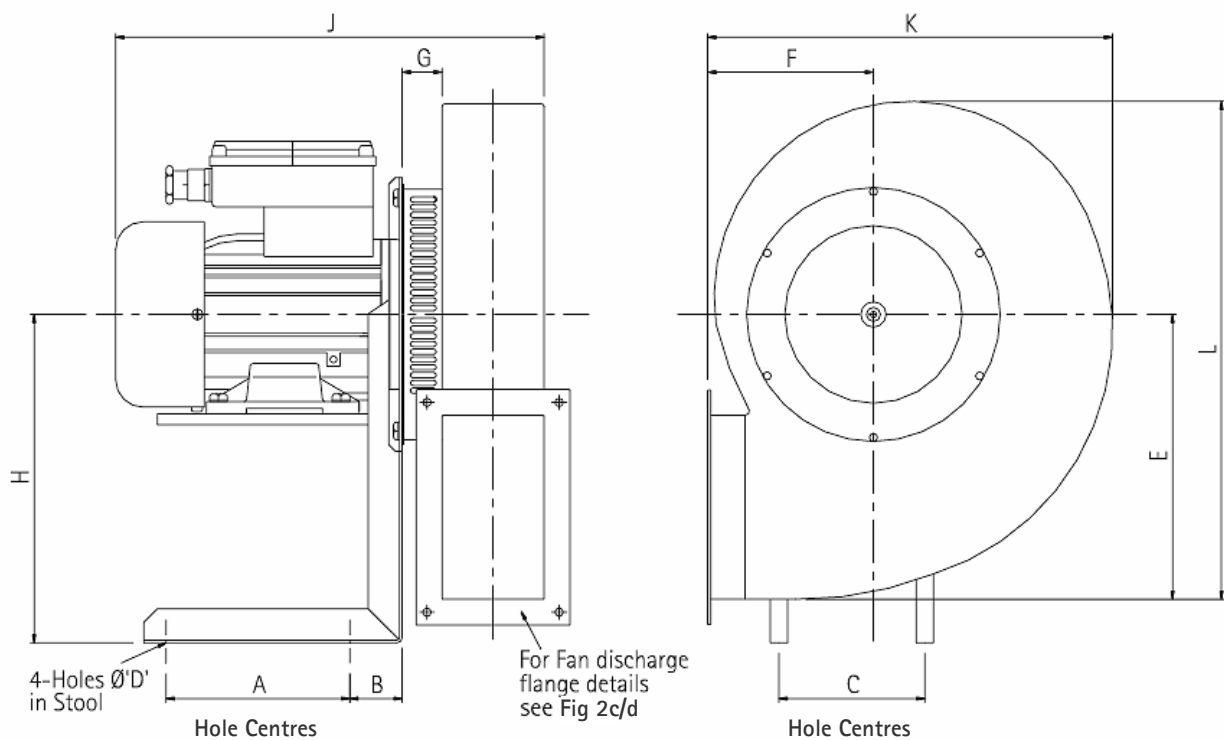


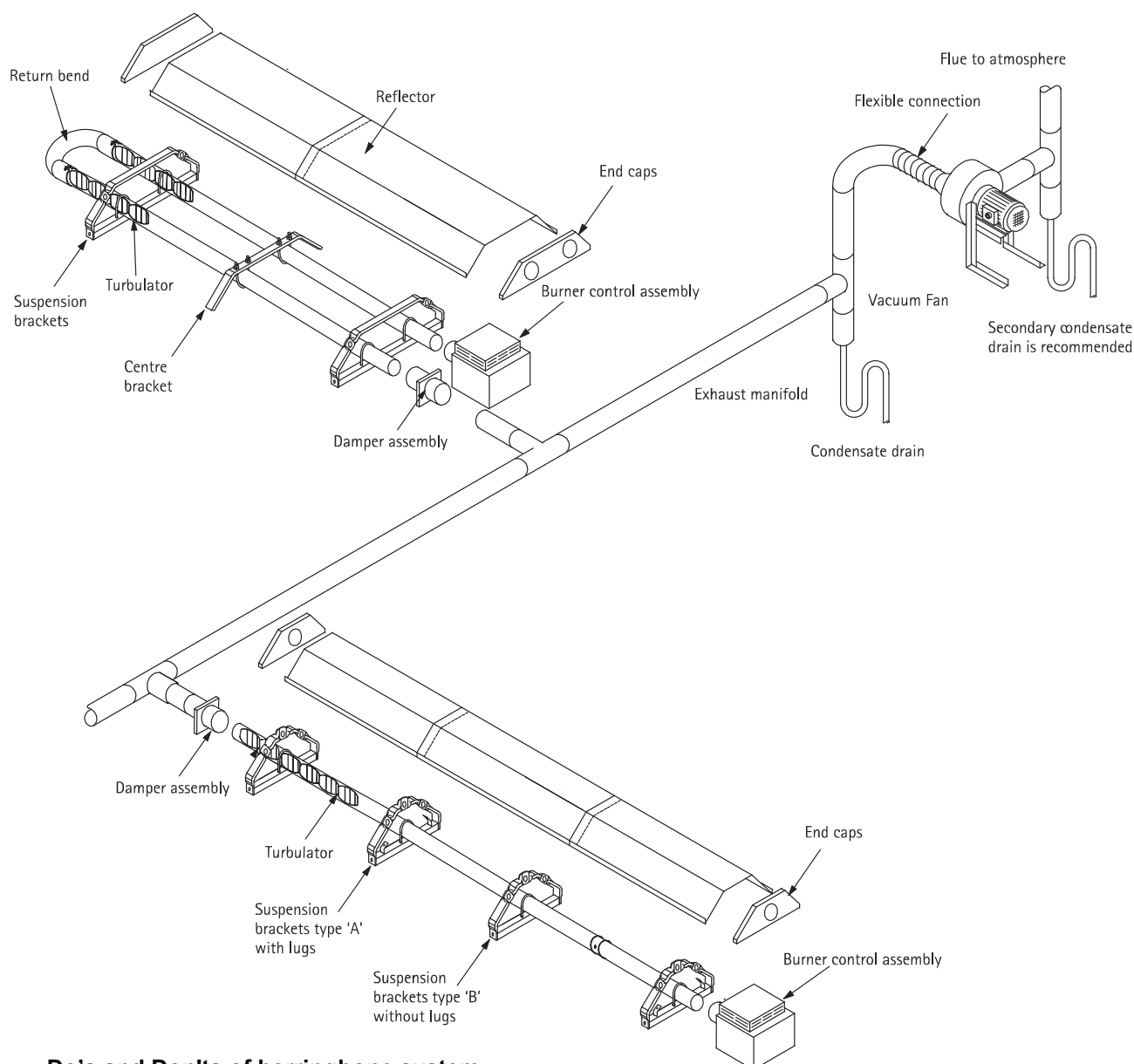
Figure 2h. Typical Low Fan Arrangement

Figure 3. Vacuum fan mounting details (Type 'O' fan illustrated)



Fan	Type O	Type 2
A	124	80
B	38	35
C	175	174
D	7.1	7
E	209	125
F	153	100
G	42	25
H	239	120
J	340	210
K	332	205
L	363	215
Power (watts)	550	120
Running Current (amps)	2.6	0.8
Voltage	230V 1ph	230V 1ph

Figure 4. Typical Herringbone system



Do's and Don'ts of herringbone system

Do's	Don'ts
Check design pressure drop.	Run drains in copper or mild steel pipework.
Check for corrosive industrial process in proposed building - e.g. cleaning, electroplating, printers using sugar powder etc.	Install system with extra 90° bends without asking AmbiRad if the system will operate correctly.
Drain all flue ducts and seal all joints.	Install flue with vertical rise without firstly fitting a drain point at it's lowest level.
Secure joints with pop rivets as well as sealing compound (refer to assembly instructions).	Fit fan with outlet vertical or with top horizontal discharge.
Fit drain traps before and after fans (see figs 2).	Fit damper upside down or on it's side.
Fit expansion joints before fan and at intermediate points on the herringbone system.	Fit damper wrong way round. (see fig12 page 20.)
Run drains in galvanised steel or plastic pipes.	
Follow guide to combined flue heating system.	

1.6 Clearance to Combustibles.


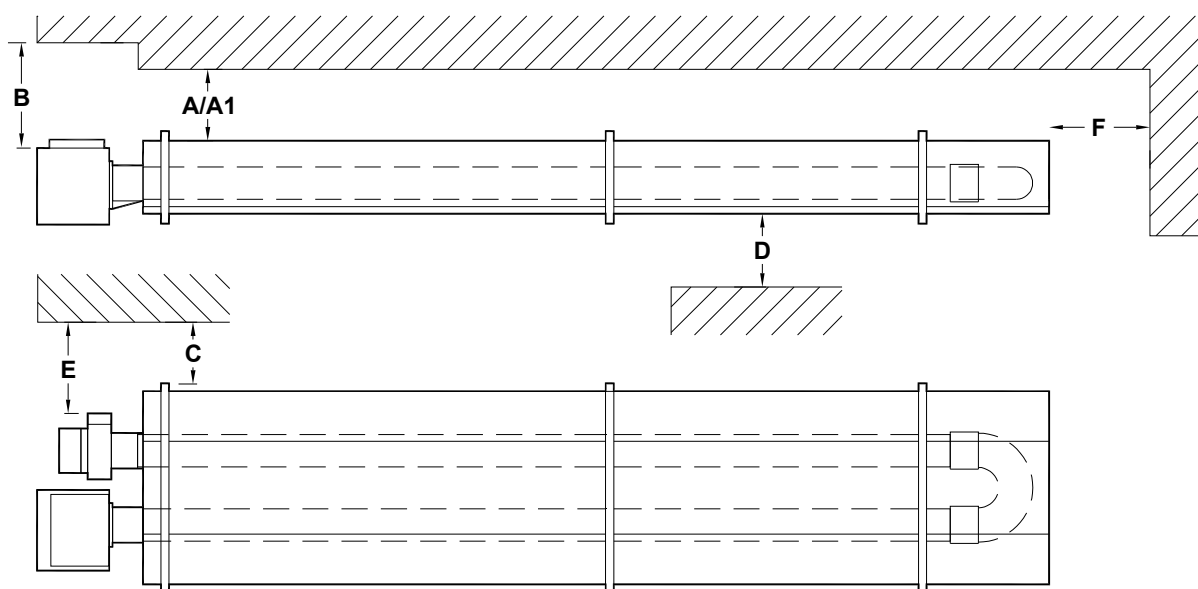
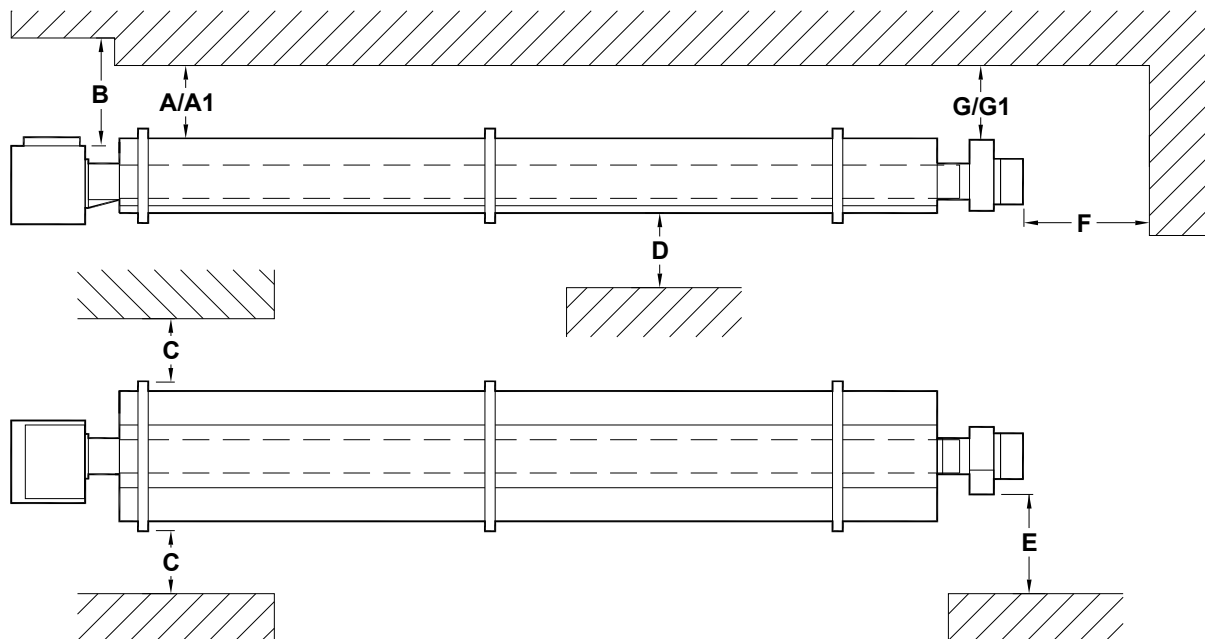
 The minimum clearances to combustible materials are given in the tables below. These minimum distances **MUST** be adhered to at all times.

Figure 5. a Diagram illustrating the clearance to combustibles (U tube shown)



VSUT / VSAUT		15	25	35
Above Reflector (VSUT NG ONLY)	A	180	180	180
Above Reflector (VSAUT and ALL LPG ONLY)	A1	280	280	280
Above Burner / Heater Outlet	B	500	500	500
To the Sides	C	900	1000	1100
Below Tubes	D	1500	1700	2100
Horizontally from Heater Outlet (UNFLUED)	E	1200	1200	1200
End Wall (VSUT ONLY)	F	500	500	500

Figure 5.b Diagram illustrating the clearance to combustibles



VS(A)LI; VS(A)LH; VS(A)DL		15	25	35
Above Reflector (VSLI/LH/DL NG ONLY)	A	150	150	150
Above Reflector (VSALI/LH/DL NG and ALL LPG ONLY)	A1	280	280	280
Above Burner	B	500	500	500
To the Sides	C	750	750	750
Below Tubes	D	1500	1700	2100
Horizontally from Heater Outlet (UNFLUED)	E	1200	1200	1200
End Wall	F	500	500	500
Above Heater Outlet (FLUED)	G	150	150	150
Above Heater Outlet (UNFLUED)	G1	500	500	550

1.7 Gas Connection and Supply



Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

A new gas meter (natural gas) or cylinder (propane) are to be connected to the service pipe by the Local Gas Authority or Licensed Plumber and Gas Fitter. An existing gas meter / cylinder should be checked, preferably by the Local Authority Supplier, to ensure that the meter is adequate for the rate of gas supply required. Installation pipes should be fitted in accordance with AS/NZS 5601.1, so that the supply pressure, as stated in Table 2 will be achieved.

It is the responsibility of the competent engineer to ensure that other relevant Standards and Codes of Practice are complied with. Pipes of smaller size than the heater inlet gas connection must not be used.

The complete installation must be tested for soundness as described in AS/NZS 5601.1. It is recommended that installation pipes be purged of any debris before being installed or after installation but before heaters are connected.



A gas union service cock MUST be fitted in the gas supply close to the heater, but not onto the burner itself.



Take care when making a gas connection to the heater not to apply excessive turning force to the internal controls.

A final connection to the heater to allow safe linear expansion of the heater without creating undue stress on the gas supply pipe work must be used. It is therefore important that a tested and approved hose assembly to AS/NZS 1869 or a limited flexibility connector to AS 4361 is installed as per these instructions.

Ensure that expansion is taken up in the body of the hose and not on its attachment to the pipe work. The cone seat adapter supplied on one end of the flexible gas hose provides a 'swivel' action, and must be fitted on the burner using a 1/2" BSP barrel nipple to provide ease of disconnection for future servicing.



The minimum bore for flexible gas hose assembly is 19mm for the VS35 natural gas model. For all other models the minimum bore for the flexible gas hose assembly is 12mm.

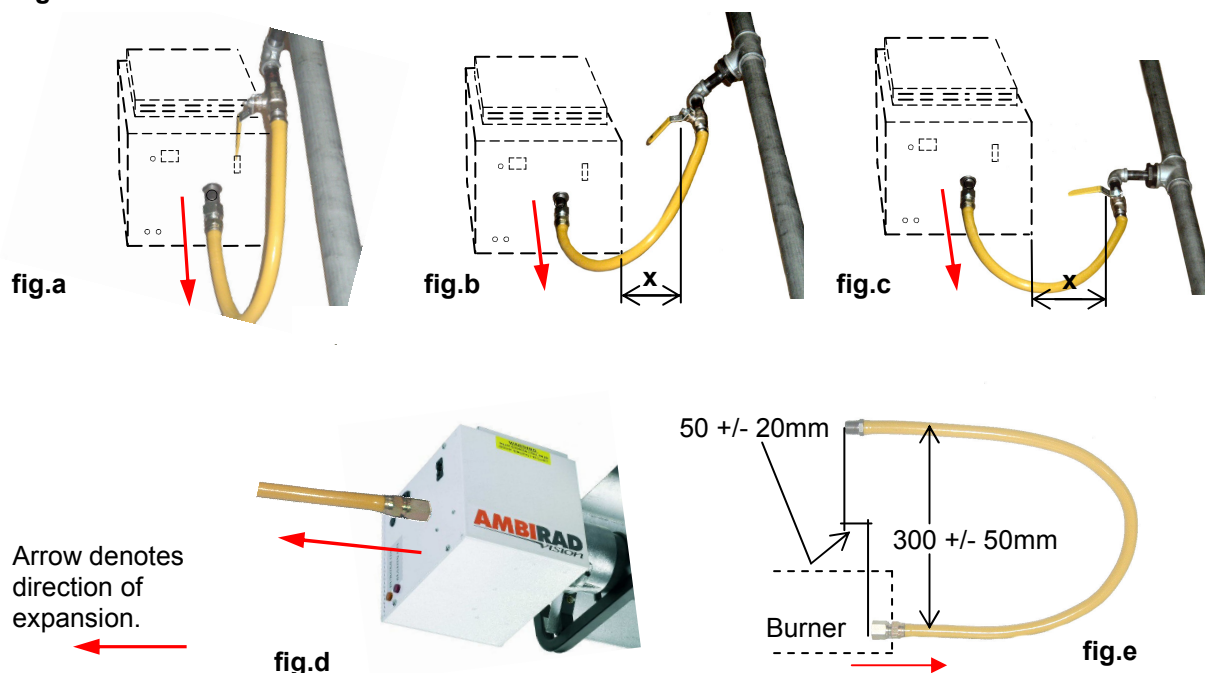


The gas supply must not be in a position where it is subject to overheating.



The installation layout described below is the only method recommended by AmbiRad and must only be carried out by a qualified / competent gas engineer.

Figure 6. Correct Installation of Flexible Gas Connection




Depending on the specific installation, the flexible gas hose may be routed to the gas cock at any of the following angles in relation to the burner:

Vertical (fig.a)


45° angle (fig.b)


90° angle (fig.c)

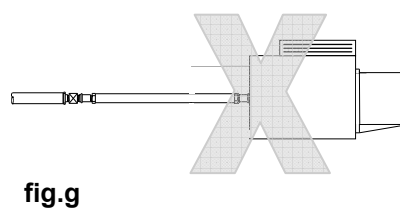
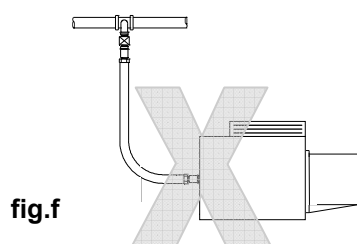
Any other position in between these angles is acceptable.

 A clearance distance 'x' of min 200mm must be observed to allow side door access.

Care must be taken to observe the minimum pipe bend diameter (minimum 250mm, maximum 350mm) & pipe expansion distance (minimum 30mm, maximum 70mm) as shown in fig.e.

 Maximum bend diameter for the 1000mm hose is 450mm.

 The correct installation as shown will allow for approx 100mm of movement due to expansion.



The methods shown in fig.f and fig.g are unacceptable, due to undue stress on the hose & fittings.

Table 2 Gas Supply Pressures

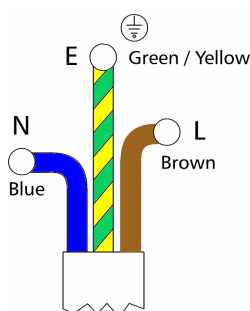
Gas Type	Natural Gas	Propane
Max Supply Pressure (kPa)	2.5	5.0
Min Supply Pressure (kPa)	1.0	2.5
Nominal Pressure (kPa)	1.13	2.75
Gas Supply	Connection R $\frac{1}{2}$ ½in BSP Internal Thread	

1.8 Electrical Connections

This appliance must be earthed.


Supply 240V 50Hz single phase.
Standard heater 116W. Herringbone 16W.
Current rating 0.55 amp max (inductive).
Fuse: external 3 amp.

All electrical work should be carried out to AS3000 standards by a competent electrician. The electrical connection to the heater is made by means of a three pin plug-in power connector. Live, neutral and earth connections should be made via a flexible supply cable to the power connector and routed clear of the heater or tubes.



The flexible supply cables should be of 0.75mm² and comply with AS3000. The wires in the mains lead are coloured in accordance with the following code:
Green & Yellow - Earth;
Blue - Neutral;
Brown - Live.

It is recommended the heater or group of heaters are controlled by thermostats, a time switch and if required manual control switches and a frost thermostat.

 We recommend use of AmbiRad approved controls.

Please refer to control manual for siting and installation details.

Where alternative manufactures controls are used, please refer to their instructions for their siting and installation details.

IMPORTANT:

All controls and switch gear must be rated to handle the total inductive load of the circuit they control. For inductive load per burner see 1.8 Electrical Connection, for herringbone fans see Figure 3. For large installations the use of relays or contactors should be considered. The method of connection to the electrical supply

must facilitate complete isolation and should be made via a fused double pole isolator having contact separation of at least 3mm in all poles and supplying the appliance only. Alternatively, connection may be made via a fused three pin plug and unswitched shuttered socket, both complying with the requirements of AS3000. Ensure that a copy of the lighting instructions are affixed adjacent to the electricity supply

Figure 7.a Typical VSUT/VSAUT Wiring Connections

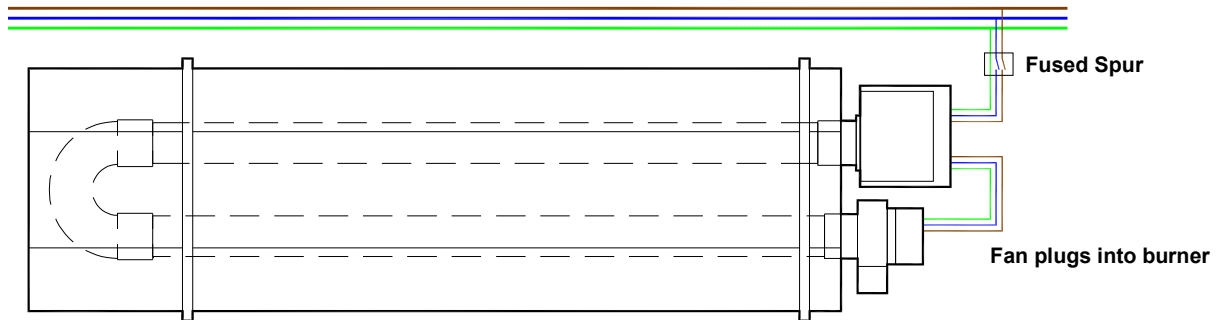


Figure 7.b Typical VSLI/VSAI Wiring Connections

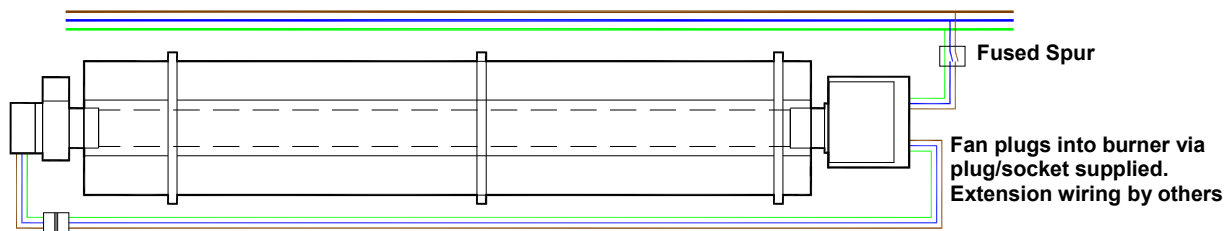


Figure 7.c Typical VSDL Wiring Connections

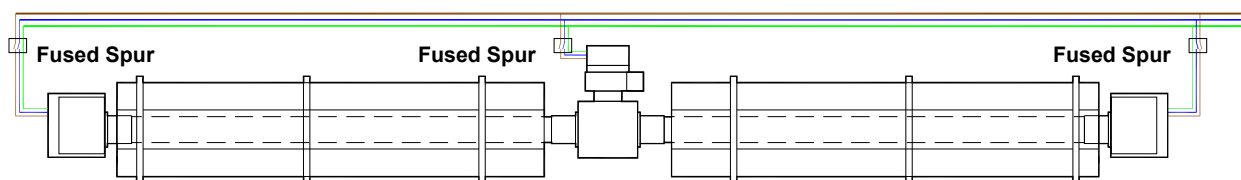


Figure 8. Internal Burner Wiring Diagram.

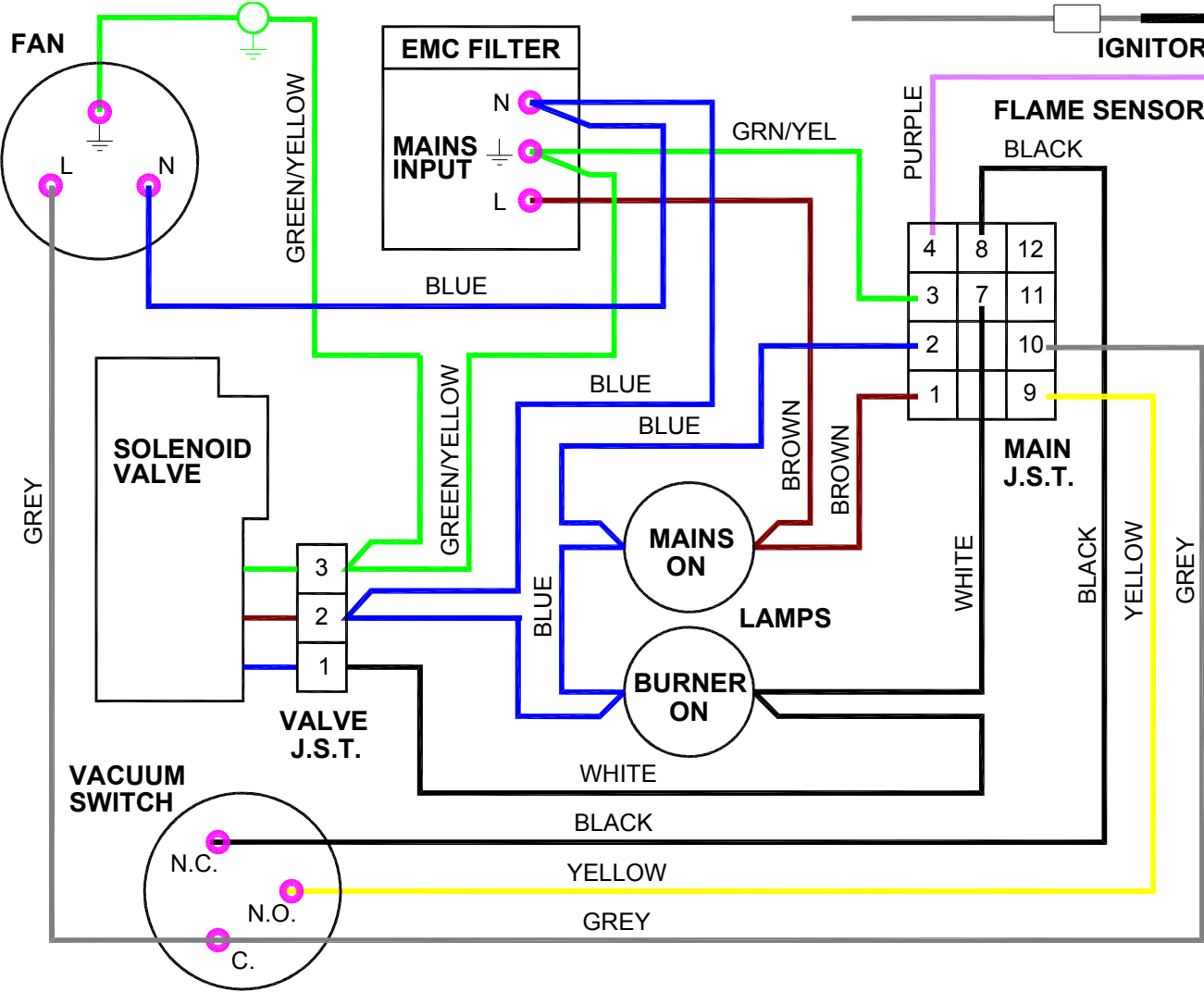
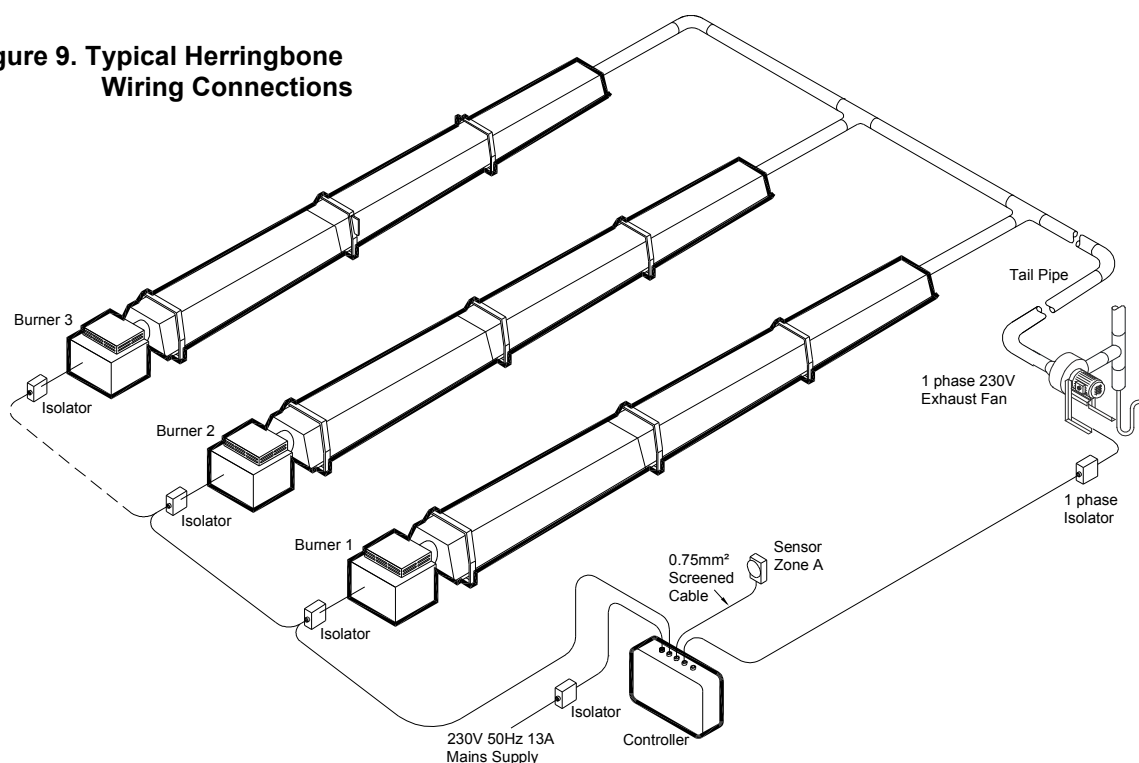


Figure 9. Typical Herringbone Wiring Connections



1.9 Ventilation Requirements

AmbiRad tube heaters can be operated as flued or unflued appliances providing the air supply and building ventilation requirements as stated in AS/NZS 5601.1 are complied with.

1.9.1 Flued Radiant Heater

Flued radiant heaters must incorporate a draught diverter (supplied as an optional extra by the manufacturer) which is fitted to the exit of the induced draught fan by means of the screws and clamp plates provided. The diverter is designed to accept a 125mm (5") nominal bore proprietary twin wall metal flue pipe complying with AS/NZS 5601.1 The joint should be sealed with heat resistant caulking and faced off with fire cement. Alternatively, single wall metal flue pipe complying with AS/NZS 5601.1 may be used. A flue pipe should be adequately supported at regular intervals from the building structure and terminated externally with a certified flue cowl. The maximum flue length is 9.0m (30') and the maximum number of bends is two. All connections in the flue pipe must be properly sealed.

Where the total input of the heaters exceed 3 MJ/h for each m³ (app. 800W/m³) of the room volume, the space must be ventilated by means of either natural or mechanical ventilation.

Natural Ventilation

Two permanent openings must be provided each with a minimum free ventilation area calculated using the formula below. The lower

opening must be located at or below the level of the heater. The upper opening must be located above the level of the draught diverter and positioned in relation to each other to provide a flow of air across the area.

$A = F \times T$ where:

A = the minimum free ventilation area, in mm²

F = the given factor shown below

T = the total gas consumption of all heaters, in MJ/h

Heaters in a room or enclosure vented directly to outside*; F = 300

Heaters in a room or enclosure vented via an adjacent room**; F = 600

Heaters in a plant room vented directly to outside*; F = 150

Heaters in a plant room vented via an adjacent room**; F = 300

* Outside means directly and without obstruction through an outside wall; through an outside wall but offset; into a cavity ventilated to outside; into an underfloor space ventilated to outside; into a roof space ventilated to outside.

** Openings based on this formula should apply to any subsequent rooms until ventilated to outside, or the total input of the heaters does not exceed 3MJ/h for each m³ of the total volume of the enclosure and rooms.

Mechanical Ventilation.

Air supply to the room may be drawn from outside by mechanical means in accordance with the requirements below. The lower opening must be located at or below the level of the heater. The upper opening must be located

above the level of the draught diverter and positioned in relation to each other to provide a flow of air across the area.

Low level air supply.

Minimum air flow required (L/s) = appliance input* in MJ/h x 0.3

High level exhaust.

Mechanical output (L/s) = between $\frac{1}{4}$ and $\frac{1}{3}$ of the rate of inlet air required.

* Appliance input is to include the total input of all heaters in the area including those using other fuels.

Interlock

Where mechanical ventilation is used, an interlock must be provided to ensure the gas supply to the heaters is shut off in the event of a failure of the mechanical air supply system. The sensor used on this interlock must be one that will sense actual air movement **and fail safe**.

The relevant authorities should be consulted as in some instances this flueing may not be required.

Under no circumstances are heaters to be fitted to a power flue exhaust. Purpose designed Herringbone Systems are available upon request. Connection to a power flue exhaust will negate both Saacke / AmbiRad warranty and AGA approval certification.

1.9.2 Unflued Radiant Heater

Radiant tube heaters can be installed as unflued appliances when this is carried out in accordance with the current version of AS/NZS 5601.1 Gas Installation Code, Section 'AIR SUPPLY TO APPLIANCES'.

In addition to the ventilation requirements, consideration needs to be given to the possibility of condensation forming on cold surfaces.

It should be noted that the clearance distance around the burner increases when the unit is operated unflued (see section 1.6). It should be ensured that the combustion gases do not impinge on any combustible materials.

Where the total input of the heaters exceed 3 MJ/h for each m³ (app. 800W/m³) of the room volume, the space must be ventilated by means of either natural or mechanical ventilation.

Natural Ventilation

Two permanent openings must be provided each with a minimum free ventilation area

calculated using the formula below. The openings must be located so that the distance from the top of the upper opening to the ceiling and the distance from the bottom of the lower opening to the floor does not exceed 5% of the height of the room. The two openings may be combined if these distances exceed the 5%.

$A = F \times T$ where:

A = the minimum free ventilation area, in mm²

F = the given factor shown below

T = the total gas consumption of all heaters, in MJ/h

Heaters in a room or enclosure vented directly to outside**; F = 300

Heaters in a room or enclosure vented via an adjacent room***; F = 600

Heaters in a plant room vented directly to outside**; F = 150

Heaters in a plant room vented via an adjacent room***; F = 300

** Outside means directly and without obstruction through an outside wall; through an outside wall but offset; into a cavity ventilated to outside; into an underfloor space ventilated to outside; into a roof space ventilated to outside.

*** openings based on this formula should apply to any subsequent rooms until ventilated to outside, or the total input of the heaters does not exceed 3MJ/h for each m³ of the total volume of the enclosure and rooms.

Mechanical Ventilation.

Air supply to the room may be drawn from outside by mechanical means in accordance with the requirements below. The openings must be located so that the distance from the top of the upper opening to the ceiling and the distance from the bottom of the lower opening to the floor does not exceed 5% of the height of the room. The two openings may be combined if these distances exceed the 5%.

Low level air supply.

Minimum air flow required (L/s) = appliance input* in MJ/h x 0.3

High level exhaust.

Mechanical output (L/s) = between $\frac{1}{4}$ and $\frac{1}{3}$ of the rate of inlet air required.

* Appliance input is to include the total input of all heaters in the area including those using other fuels.

Interlock

Where mechanical ventilation is used, an interlock must be provided to ensure the gas supply to the heaters is shut off in the event of a failure of the mechanical air supply system. The sensor used on this interlock must be one that will sense actual air movement **and fail safe**.

1.10 Flue systems and Combustion Air Inlets

1.10.1 Unitary Heaters

Flued heaters must be run in either Ø125mm single skin or twin wall flue system (see fig.10)
 All flues must terminate vertically.
 Maximum flue length = 9.0m @ Ø125mm
 Maximum no of bends = 2
 For further information on flue runs, please refer to AS/NZS 5601.1

1.10.2 Herringbone systems

All Herringbone flue systems must be run in minimum Ø100mm.
 Maximum flue length = 11.0m
 Maximum no of 90° bends = 4
 For further information on flue runs, please refer to AS/NZS 5601.1

All Herringbone systems must be fitted with a

draught diverter on the outlet of the fan as supplied by Saacke as an optional extra.

1.10.3 Ducted Air option

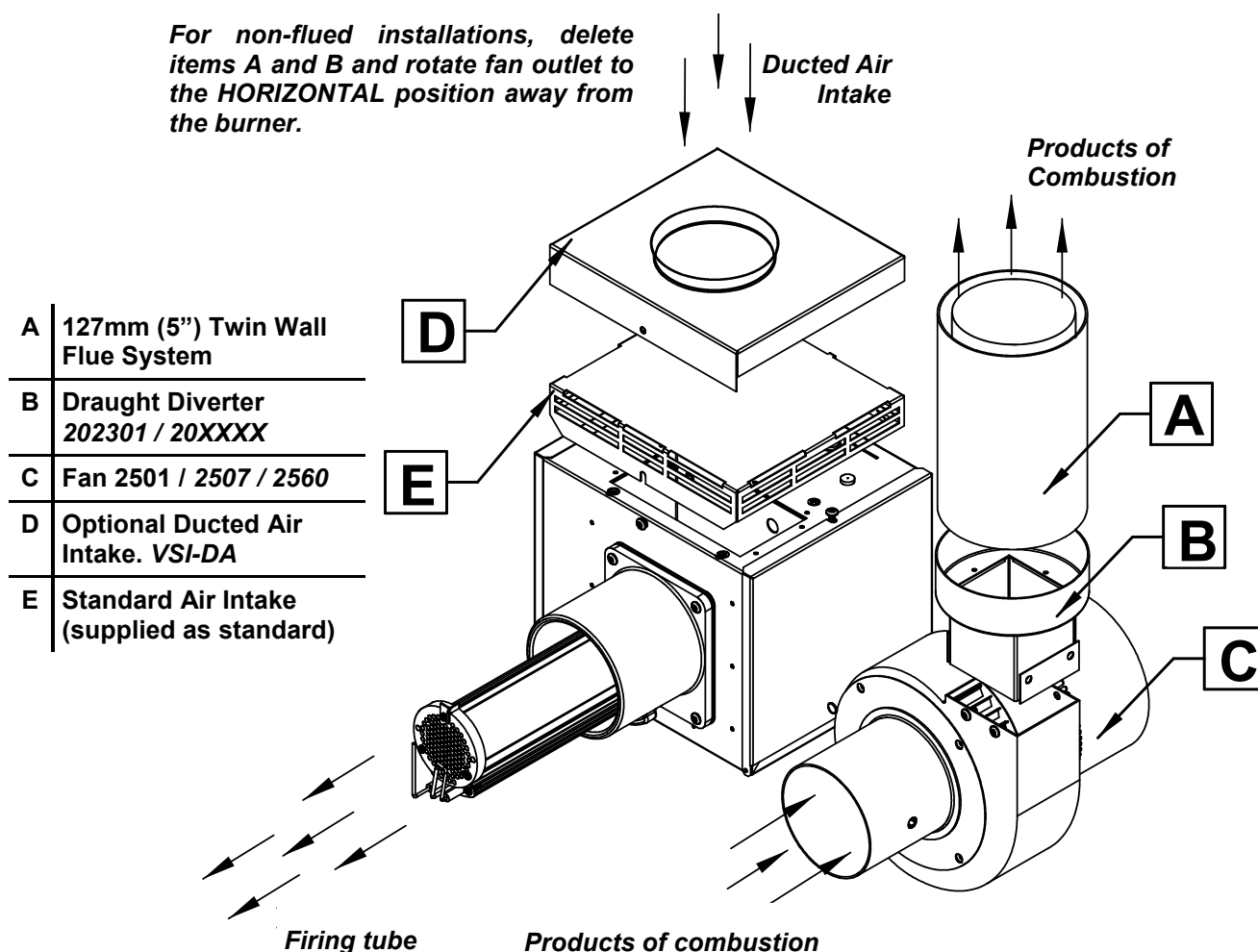
Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere e.g. Chlorinated Vapours.

A ducted air intake adapter plate is optional (see fig.10)
 Maximum length = 9.0m
 Minimum diameter = 100mm
 Maximum no of bends = 2

A weather proof cowl must be fitted to the air duct inlet terminal. Note: Air for combustion must not be impeded by a restrictive cowl. If the duct inlet is located on a roof the underside of the inlet cowl must be at least 500mm above roof level and at least 2500mm higher than any projection on the roof within a 2m radius of the cowl.

Figure 10. Unitary Flue Attachment Induced Burners (VSUT or VSAUT)

For non-flued installations, delete items A and B and rotate fan outlet to the HORIZONTAL position away from the burner.



1.11 Technical Details.

Table 3 - Natural Gas

No of Injectors			1						
Gas Connection			½ in BSP Internal thread						
Flue Nominal Bore mm (in)			125 (5)						
Unitary Fan Motor Details			240 volt 1 phase 50Hz						
Heater Model	Gross Heat Input		Gas Flowrate (m³/hr)	Injector Pressure (kPa)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
	kW	MJ/h							
VS(A)15UT	15.2	54.7	1.4	0.74	7 x 1.4	240x3417x500	43	0.5	2501
VS(A)15UH	15.2	54.7	1.4	0.74	7 x 1.4	240x3417x500	42	N/A	N/A
VS(A)25UT	23.5	84.6	2.3	0.80	7 x 1.8	240x5066x500	60	1.0	2507
VS(A)25UH	23.5	84.6	2.3	0.80	7 x 1.8	240x5066x500	59	N/A	N/A
VS(A)35UT	36.0	129.6	3.4	0.80	7 x 2.4	260x5709x670	92	0.5	2560
VS(A)35UH	36.0	129.6	3.4	0.80	7 x 2.4	260x5709x670	91	N/A	N/A
Heater Model	Gross Heat Input		Gas Flowrate (m³/hr)	Injector Pressure (kPa)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
	kW	MJ/h							
VS(A)15LI6	15.2	54.7	1.4	0.74	7 x 1.4	390x5725x315	43	0.5	2501
VS(A)15LH6	15.2	54.7	1.4	0.74	7 x 1.4	390x5725x315	42	N/A	N/A
VS(A)35LI10-5	36.0	129.6	3.4	0.80	7 x 2.4	390x10787x470	103	0.5	2560
VS(A)35LH10-5	36.0	129.6	3.4	0.80	7 x 2.4	390x10787x470	101	N/A	N/A

Table 4 Technical Details - Propane Gas

Heater Model	Gross Heat Input		Flowrate (l/hr)	Injector Pressure (kPa)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
	Gross	MJ/h							
VS(A)15UT	15.2	54.7	2.16	2.00	4 x 1.2	240x3417x500	43	0.5	2501
VS(A)15UH	15.2	54.7	2.16	2.00	4 x 1.2	240x3417x500	42	N/A	N/A
VS(A)25UT	23.5	84.6	3.34	1.08	7 x 1.3	240x5066x500	60	1.0	2507
VS(A)25UH	23.5	84.6	3.34	1.08	7 x 1.3	240x5066x500	59	N/A	N/A
VS(A)35UT	37.0	133.2	5.26	2.24	7 x 1.4	260x5709x670	92	0.5	2560
VS(A)35UH	37.0	133.2	5.26	2.24	7 x 1.4	260x5709x670	91	N/A	N/A

Heater Model	Gross Heat Input		Flowrate (l/hr)	Injector Pressure (kPa)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
	Gross	MJ/h							
VS(A)15LI6	15.2	54.7	2.16	2.00	4 x 1.2	390x5725x315	43	0.5	2501
VS(A)15LH6	15.2	54.7	2.16	2.00	4 x 1.2	390x5725x315	42	N/A	N/A
VS(A)35LI10-5	37.0	133.2	5.26	2.24	7 x 1.4	390x10787x470	103	0.5	2560
VS(A)35LH10-5	37.0	133.2	5.26	2.24	7 x 1.4	390x10787x470	101	N/A	N/A

Table 5. Herringbone Vacuum Fan characteristics

Fan type		Type 'O'	Type '2'
Power	(W)	550	120
Running current (overload setting)	(A)	2.6	0.8
Phase		Single	Single
Voltage	(V)	230	230


Table 6. Herringbone & DL Settings- Natural Gas

Model	Cold HB Pressure		Hot HB Pressure	
	kPa	mbar	kPa	mbar
VS(A)15UH	0.25	2.5	0.14	1.4
VS(A)25UH	0.24	2.4	0.20	2.0
VS(A)35UH	0.30	3.0	0.20	2.0
VS(A)15LH6/DL12	0.27	2.7	0.14	1.4
VS(A)35LH10-5/DL21	0.33	3.3	0.18	1.8


Table 7. Herringbone & DL Settings- Propane Gas


Model	Cold HB Pressure		Hot HB Pressure	
	kPa	mbar	kPa	mbar
VS(A)15UH	0.25	2.5	0.15	1.5
VS(A)25UH	0.24	2.4	0.21	2.1
VS(A)35UH	0.37	3.7	0.23	2.3
VS(A)15LH6/DL12	0.27	2.7	0.14	1.4
VS(A)35LH10-5/DL21	0.37	3.7	0.23	2.3

2. Assembly Instructions.

 **PLEASE READ** this section prior to assembly to familiarise yourself with the components and tools you require at the various stages of assembly. Carefully open the packaging and check the contents against the parts and check list.

The manufacturer reserves the right to alter specifications without prior notice.

 Please ensure that all packaging is disposed of in a safe and environmentally friendly way.

 For your own safety we recommend the use of safety boots and leather faced gloves when handling sharp or heavy items. The use of protective eye wear is also recommended.


2.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.

 Suitable alternative tools may be used.

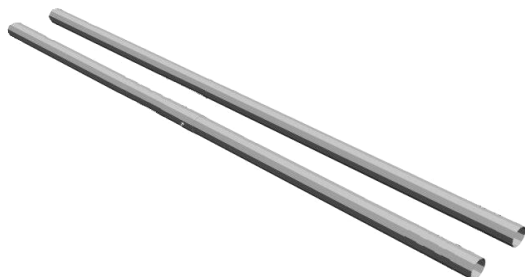


2.2 Assembly Notes.

 **Please read** these assembly notes in conjunction with the correct assembly drawings (figs 11 to 15).

2.2.1 Tubes

Identify and position tubes on trestles. For aesthetics it is advisable to position the tube seam so that these cannot be seen from beneath the heater. Mark out the position of the bracket centres from the dimensions shown on the assembly drawings.



2.2.2 Turbulators

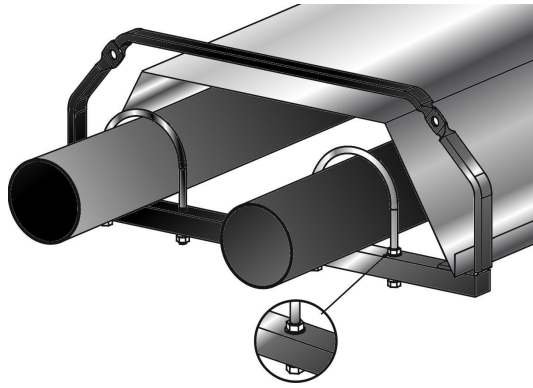
Insert turbulator(s) into tube(s) ensuring the correct length and quantity are inserted into their respective correctly identified tube(s) as detailed in the assembly drawings.

2.2.3 Brackets

There can be three types of brackets supplied with these heaters:

- Type 'A' are suspending brackets with reflector fixing points.
- Type 'B' are suspending brackets with no fixing points.
- Type 'C' is a centre bracket to retain the reflector (certain models only).

Slide the bracket assemblies along the tubes to the marked positions in their correct order as detailed in the assembly drawing. Tighten clamping 'U' bolt arrangement to tubes **ONLY WHERE STATED** on the assembly drawings.




2.2.4 U Bend.

For VS(A) 'U' tube heaters only. Slide the 'U' bend onto the tube ends with the clamping bolts facing upwards until the predefined stop position. Tighten clamping bolt arrangement using 13mm socket and wrench.

2.2.5 Couplers

For VS(A)LI, LH and DL heaters only. For joining radiant tubes, locate and position tube couplers at the end of the tubes so that the socket heads are facing outwards. Tighten clamping bolt arrangement to secure ensuring the bolts are not over tightened.

 *To avoid damaging the heater whilst installing we recommend the heater chassis be suspended prior to fitting reflectors.*



2.2.6 Reflectors.

After removing the protective plastic coating, slip the reflector through the brackets until the locating slots are aligned with the type A or C bracket fixing points.

Slide the next reflector through the brackets and overlap the existing reflector until the locating slots line up with the same bracket

fixing points. Secure overlapped reflectors to bracket using M6 nuts, bolts and flat mud washers.



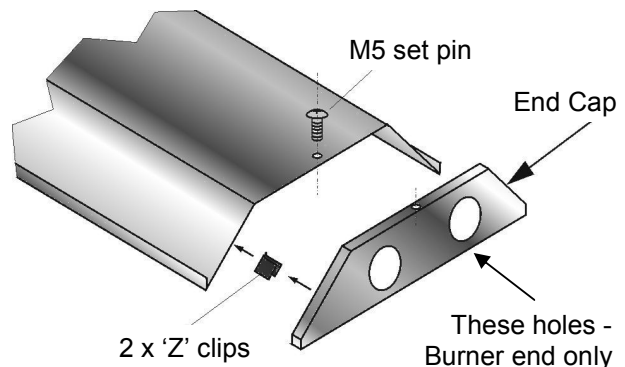
All reflectors must be positioned/ attached to the brackets exactly as detailed in the assembly drawings.

Remove the protective plastic coating.

2.2.7 End Caps.

On VSUT models only, position the end cap with no tube holes beneath the reflector profile at the U bend end with the end cap flanges facing inwards. Fasten to reflector using M5 pozi set pin and 'Z' clips. Position the end cap with tube holes beneath the reflector profile at the burner end with the end cap flanges facing inwards. Fasten to reflector using M5 pozi set pin and 'Z' clips.

On VS(A)LI, LH and DL models only, position ONE end cap beneath the reflector profile at the fan/damper end with the end cap flanges facing inwards. Fasten to reflector using 'Z' clips. Position the other end cap beneath the reflector profile at the burner end with the end cap flanges facing inwards. Fasten to reflector using 'Z' clips.



2.2.8 Burner Assembly.

On VS(A)UT only, slide the burner assembly onto the **RIGHT HAND TUBE** when viewed

from above, ensuring it is fully engaged. Secure with grub screws.

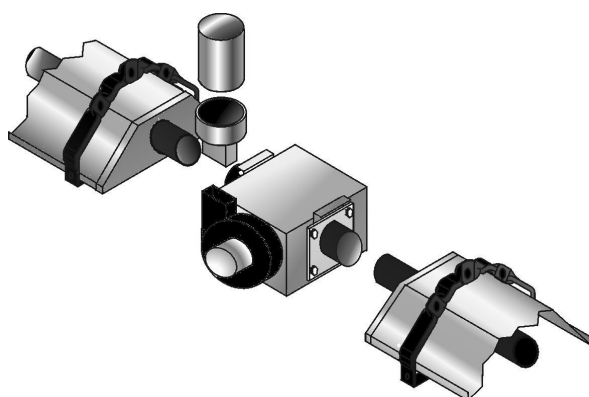
On VS(A)LI, LH and DL models only, slide the burner assembly onto the **inlet end of the tube** ensuring it is fully engaged. Secure with grub screws.

2.2.9 Fan Assembly.

On U Tube heaters only, slide fan onto the left hand tube ensuring it is fully engaged. The fan discharge should face vertically for individually flued or horizontally away from the burner if unflued.

2.2.10 Condensate Box Assembly.

On VS(A)DL models only, slide the condensate box flange onto the **outlet end of the tube** ensuring it is fully engaged. Secure with grub screws.



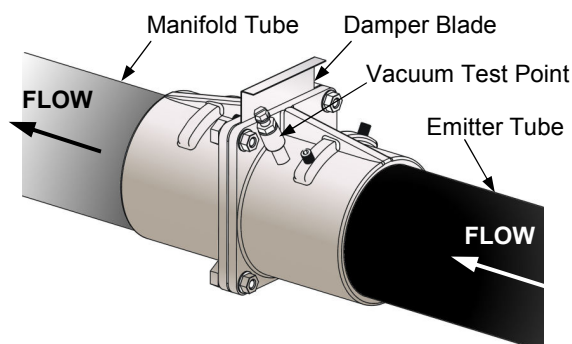
2.2.11 Herringbone Damper Assembly.

On VS(A)UH and VS(A)LH models only, slide the damper assembly flange onto the **outlet end of the tube** ensuring it is fully engaged. Secure with grub screws. Note: The damper assembly must be located with its damper blade vertical and left in the closed position. The manifold tube is to be sealed and secured (as described below) to the damper assembly.

2.2.12 Herringbone Manifold Assembly.

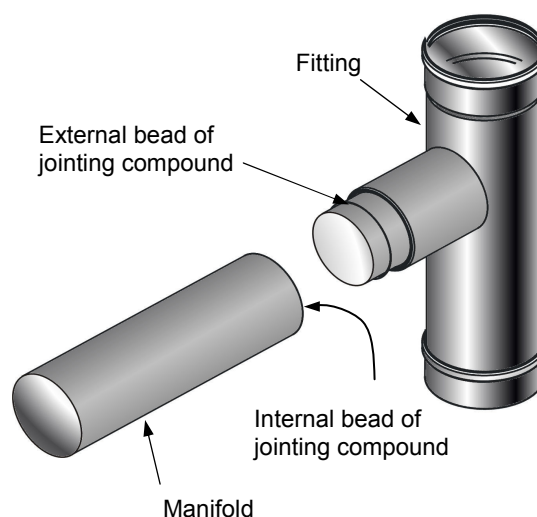
VS(A)UH and VS(A)LH models only. After fixing the heaters in the desired position, the manifold system requires fitting.

After allowing for a minimum of 75mm (3in) of penetration of the fitting into the tube, cut the tubes to the lengths required and remove all burrs and wipe off any grease or oil with a clean rag.



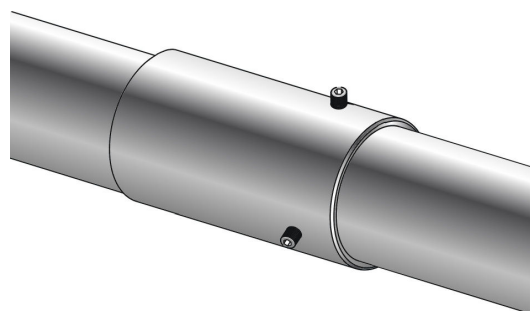
Method of jointing aluminium tube

Using the applicator gun exude 4mm diameter bead of high temperature silicon jointing compound externally round the end of the fitting and internally round the end of the tube.



Enter the fitting into the tube using a slight rotating movement to spread the jointing compound uniformly until a penetration of 75mm (3in) is achieved.

Note The silicon jointing compound remains workable after application for only 5 minutes.



Secure the joint by drilling through the tube and fitting and fix with three pop rivets at 12 o'clock, 4 o'clock and 8 o'clock positions. 4.8mm (3/16in) diameter pop rivets are recommended.

2.2.13 Detailed Assembly Drawings

The following page shows the technical dimensional details for the VSUT / VSAUT, VSUH / VSAUH, and VSLI / VSALI, VSLH / VSALH, VSDL / VSADL range of heaters.

Please note the heater type and reference number from the delivery/advice note before identifying the correct model drawing.

Figure 11. Vision Heater Assembly: Models VS/VSA U tube 15kW - 75mm (3ins) Nom Dia.

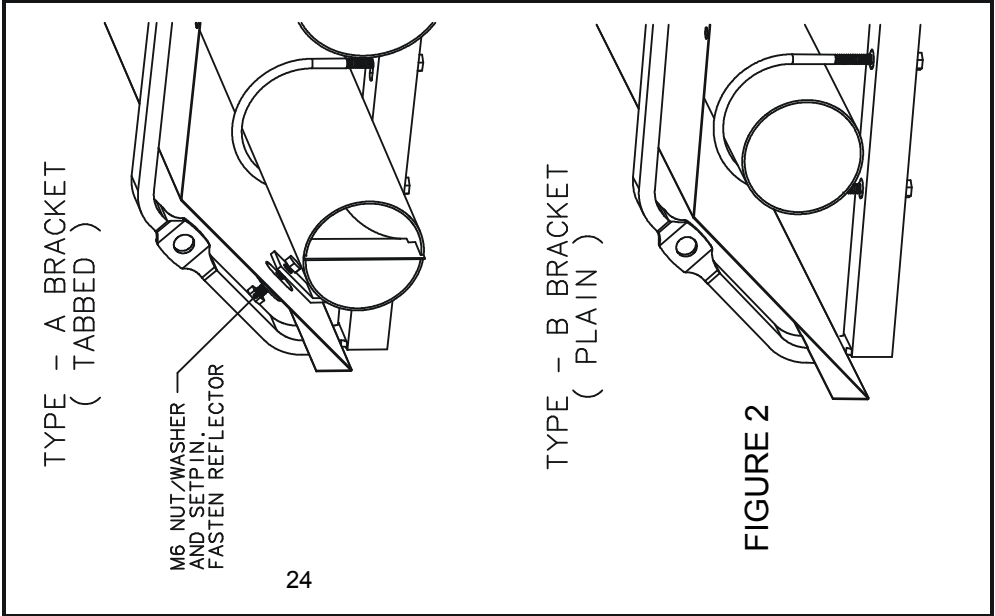
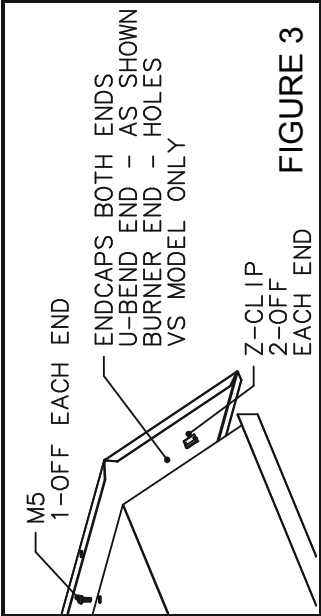
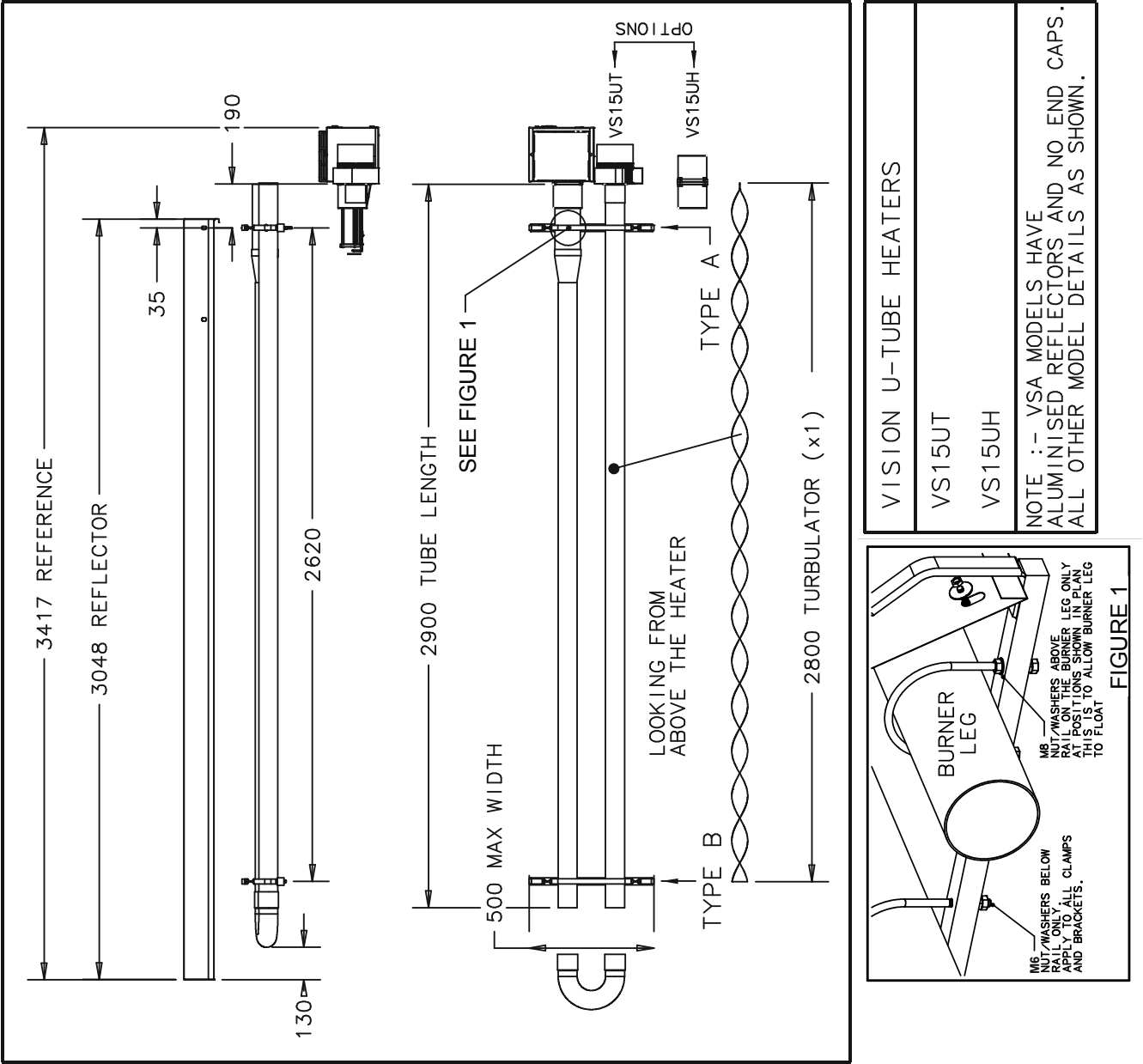


Figure 12. Vision Heater Assembly: Models VS/VSA U tube 25kW - 75mm (3ins) Nom Dia.

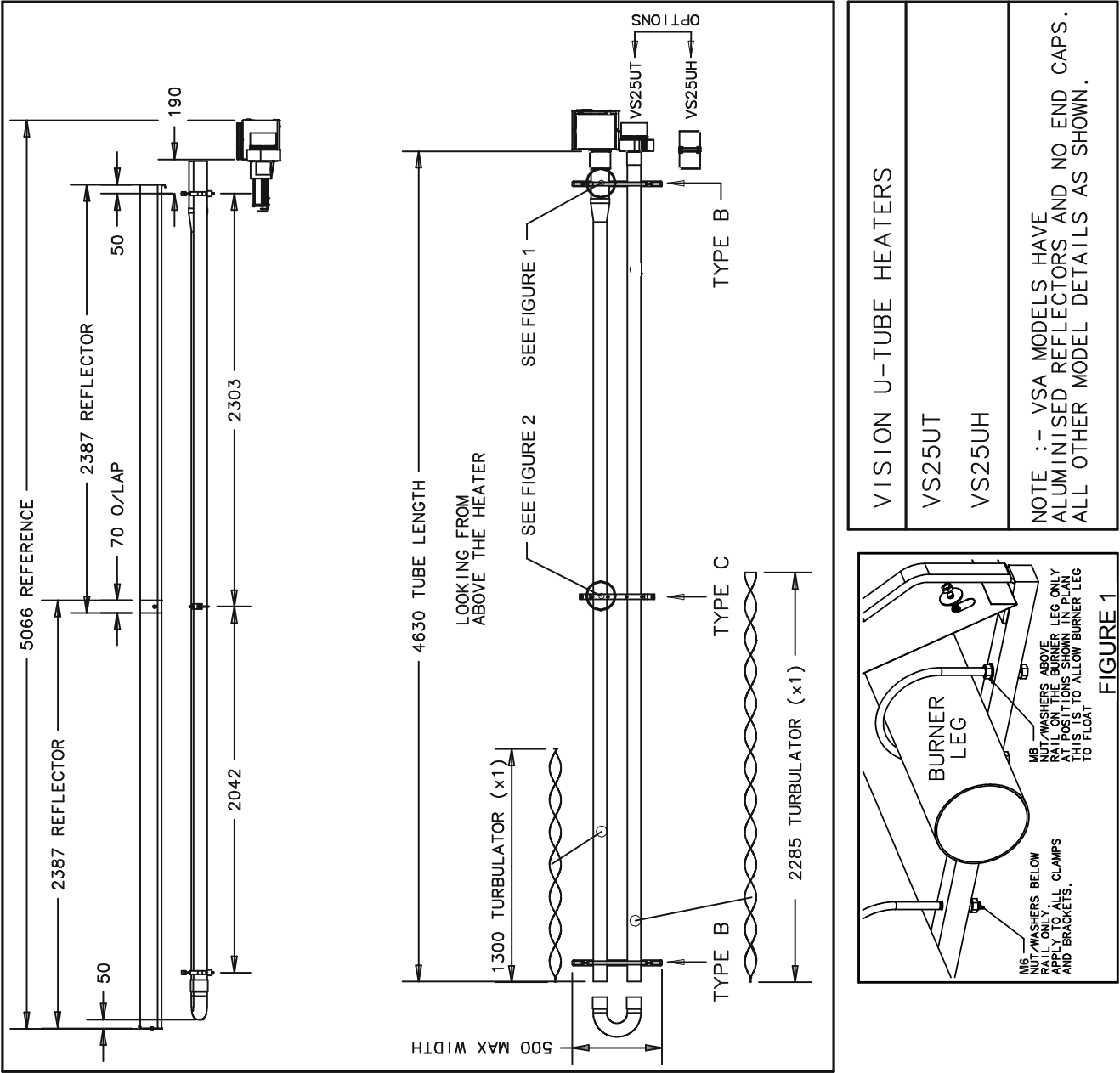


Figure 13. Vision Heater Assembly: Models VS/VSA U tube 35kW - 100mm (4ins) Nom Dia.

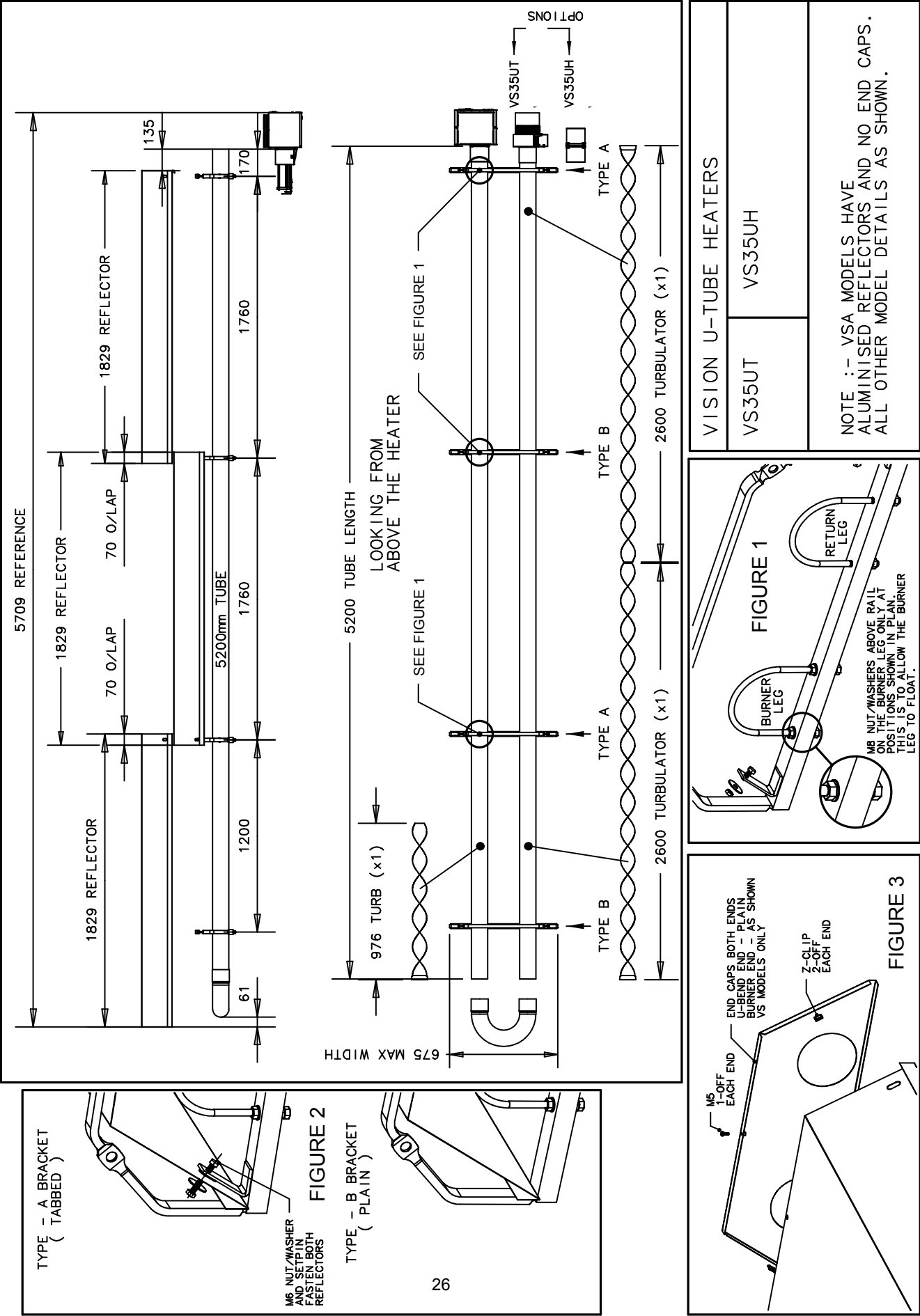


Figure 14. Vision Heater Assembly: Models VSLI/VSLH/VSDL 15kW 6m - 75mm (3ins) Nom Dia.

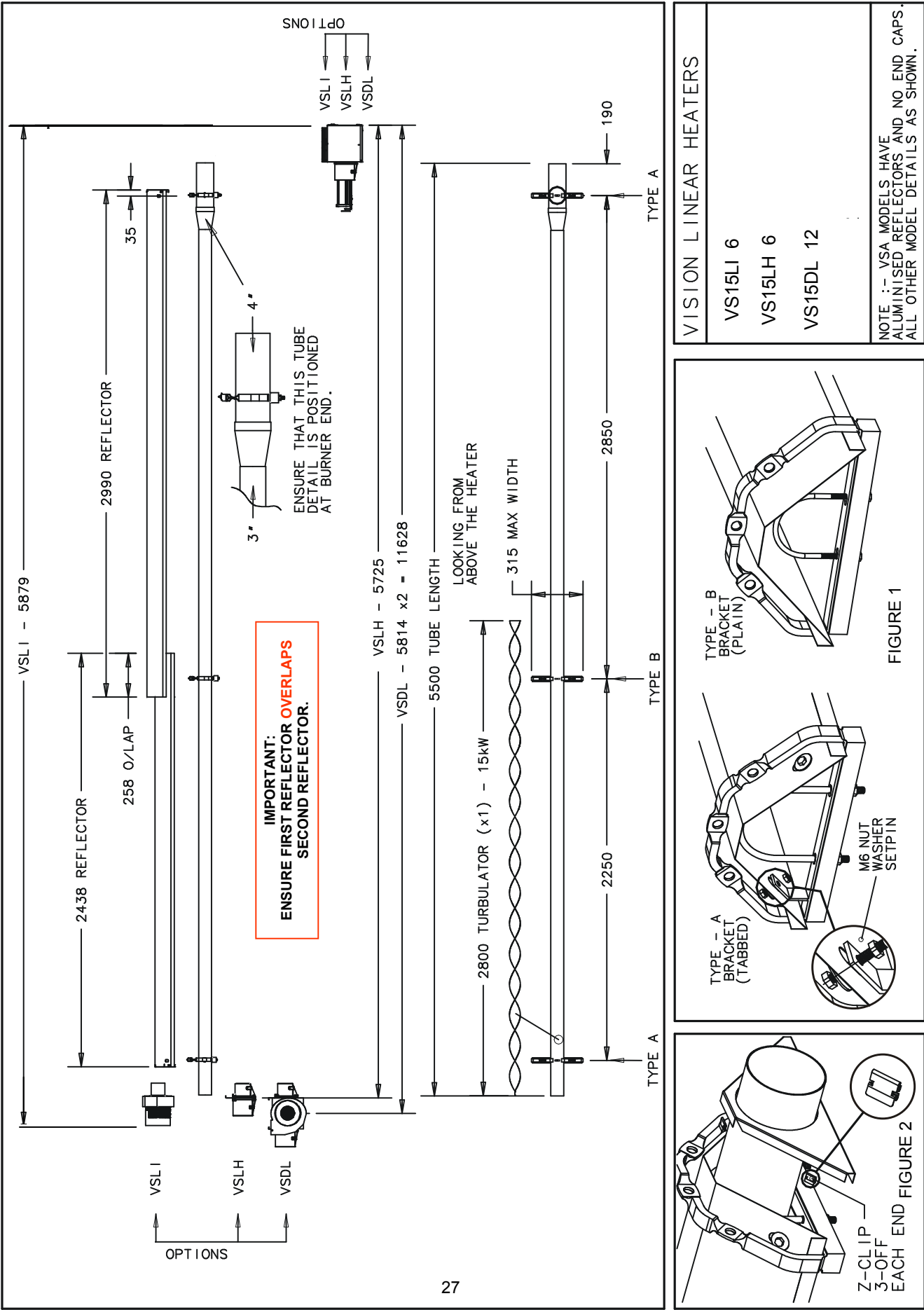
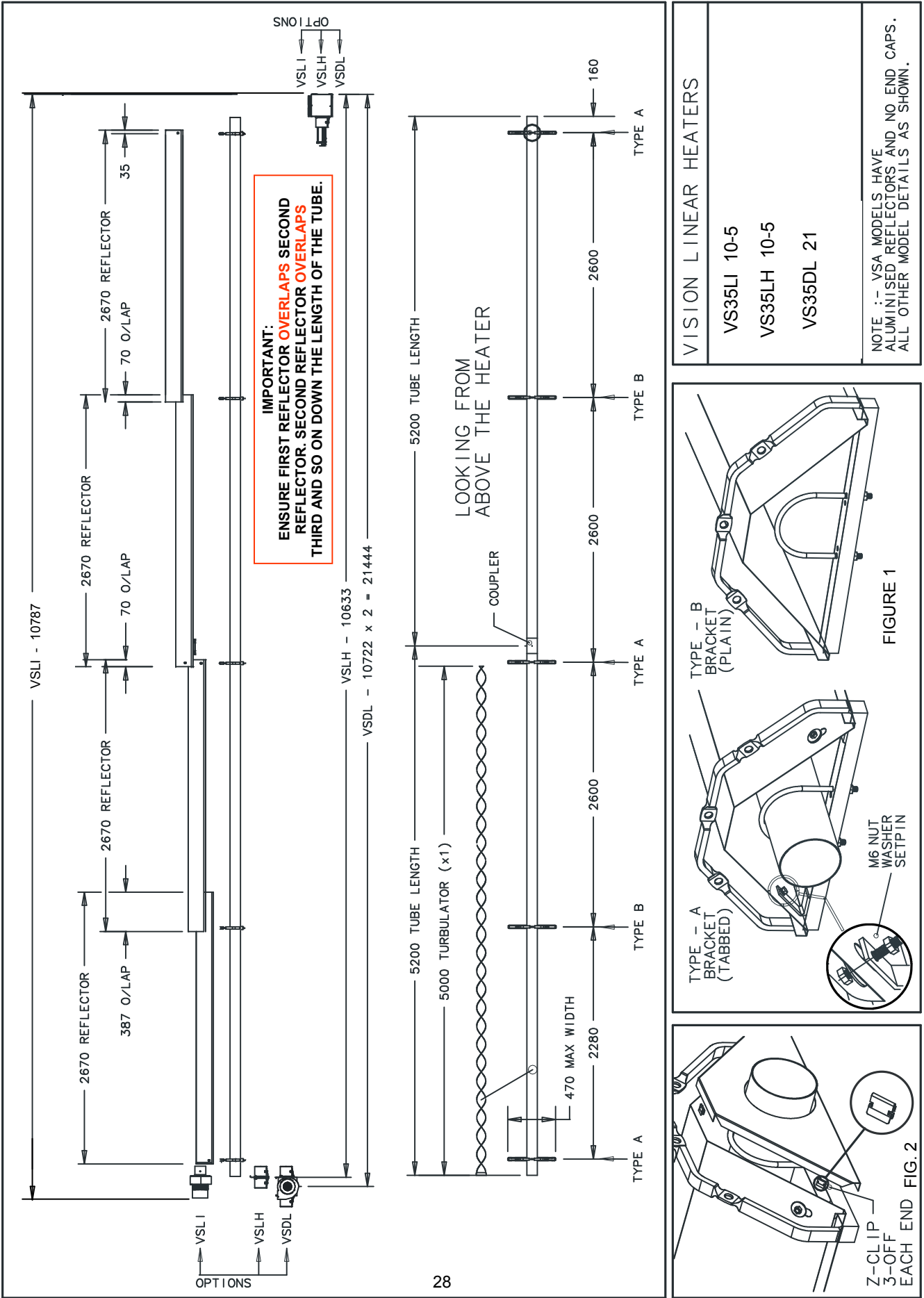


Figure 15. Vision Heater Assembly: Models VSLI/VSLH/VSDL 35kW - 10.5m - 100mm (4ins) Nom Dia.



3. Commissioning Instructions.



These appliances should be commissioned by a qualified engineer.
Ensure correct operation of the appliance before leaving.



If after the commissioning the heater/system fails to operate correctly, please refer to the fault finding sequence as shown in section 6. If the heater/system still fails to operate correctly, please consult with your Saacke representative.

3.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



Suitable alternative tools may be used.



The gas supply should be purged and tested for soundness in accordance with the Australian Gas Installation Code AS/NZS 5601.1 and any other Australian Codes of Practice.



Leather Faced Gloves



Pozidrive Screwdriver



Small Flat Head Screwdriver



Large Adjustable Spanners or Suitable Spanners for Fitting of Gas Flex.



12mm Spanner



4mm Allen Key



Manometer



Wrench with Extension



13mm Socket

3.2 Balancing The Herringbone System



Important. When all the heaters have been installed the vacuum settings must be finally balanced in the hot condition.

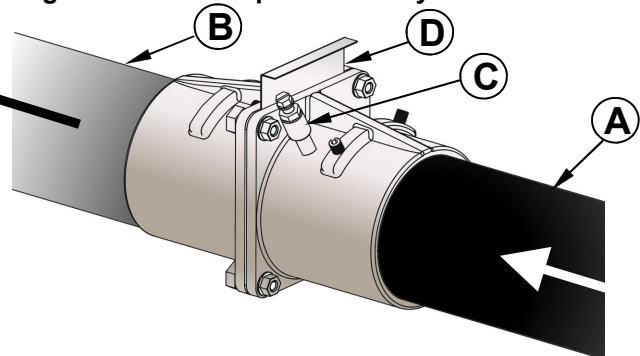
Before attempting to start up the heating system it is essential to perform the preliminary balancing of the vacuum level at each burner unit. Isolate each heater unit by unplugging the electrical connector and closing the gas isolating valve.

Start all burners up and allow them to run for at least 20 minutes. Adjust the damper at the exit of each heater using a 4mm Allen key in the damper blade securing screw. Observing the vacuum reading using a 'U' tube manometer connected to the vacuum test point (see fig16) each damper should be readjusted and set at a hot condition reading as shown in table 6

(NG) and table 7 (LPG) for the appropriate heater model.

Ref	Description
A	Radiant Emitter Tube
B	Manifold Tube
C	Vacuum Test Point
D	Damper Blade

Figure 16. HB Damper Assembly



3.3 Balancing a DL System

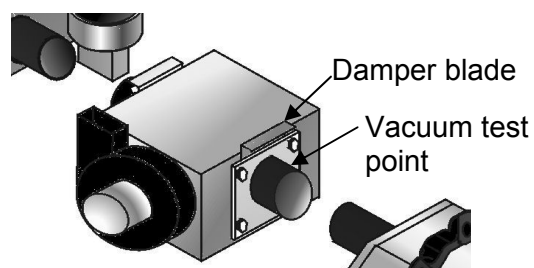


Important When all the heaters have been installed the vacuum settings must be finally balanced in the hot condition.

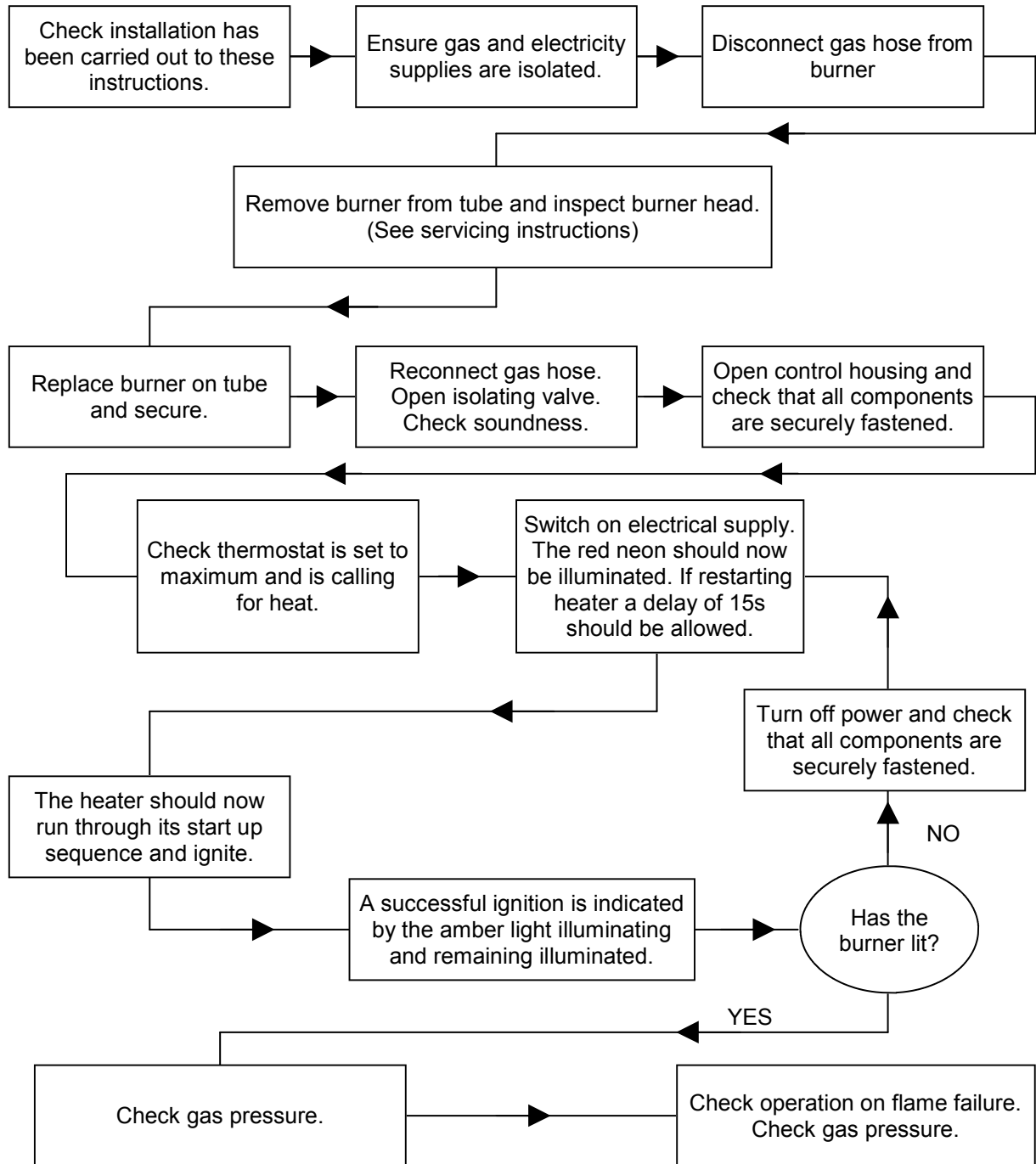
Start both burners up and allow them to run for at least 20 minutes. Adjust the damper on the condensate box using a 4mm Allen key in the damper blade securing screw. Observing the vacuum reading using a manometer connected to the vacuum test point (see figure 17) each damper should be readjusted and set at a hot

condition reading as shown in table 9 (NG) and table 10 (LPG) for the appropriate size of heater and model.

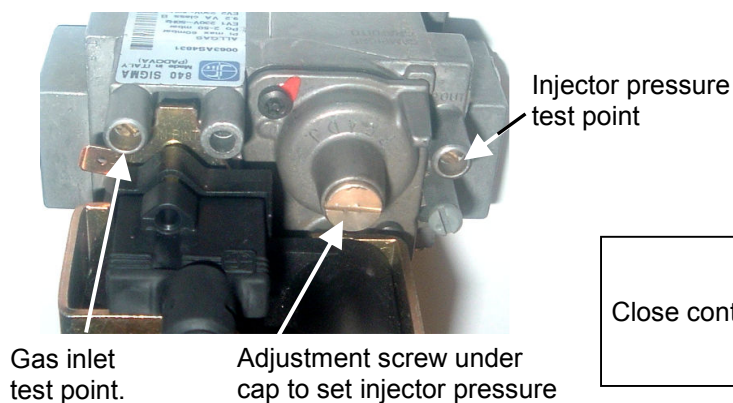
Figure 17. DL Condensate Box Assembly



3.4 Commissioning chart for VS series unitary heaters



Gas Valve adjustment



4. Servicing Instructions.



These appliances should be serviced annually by a competent person to ensure safe and efficient operation. In exceptional dusty or polluted conditions more frequent servicing may be required. Saacke offers a maintenance service. Details available on request

4.1 Tools Required.



Suitable alternative tools may be used.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



Leather Faced Gloves



Pozidrive Screwdriver



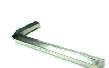
Small Flat Head Screwdriver



Large Adjustable Spanners or Suitable Spanners for Fitting of Gas Flex.



12mm Spanner



4mm Allen Key



Manometer



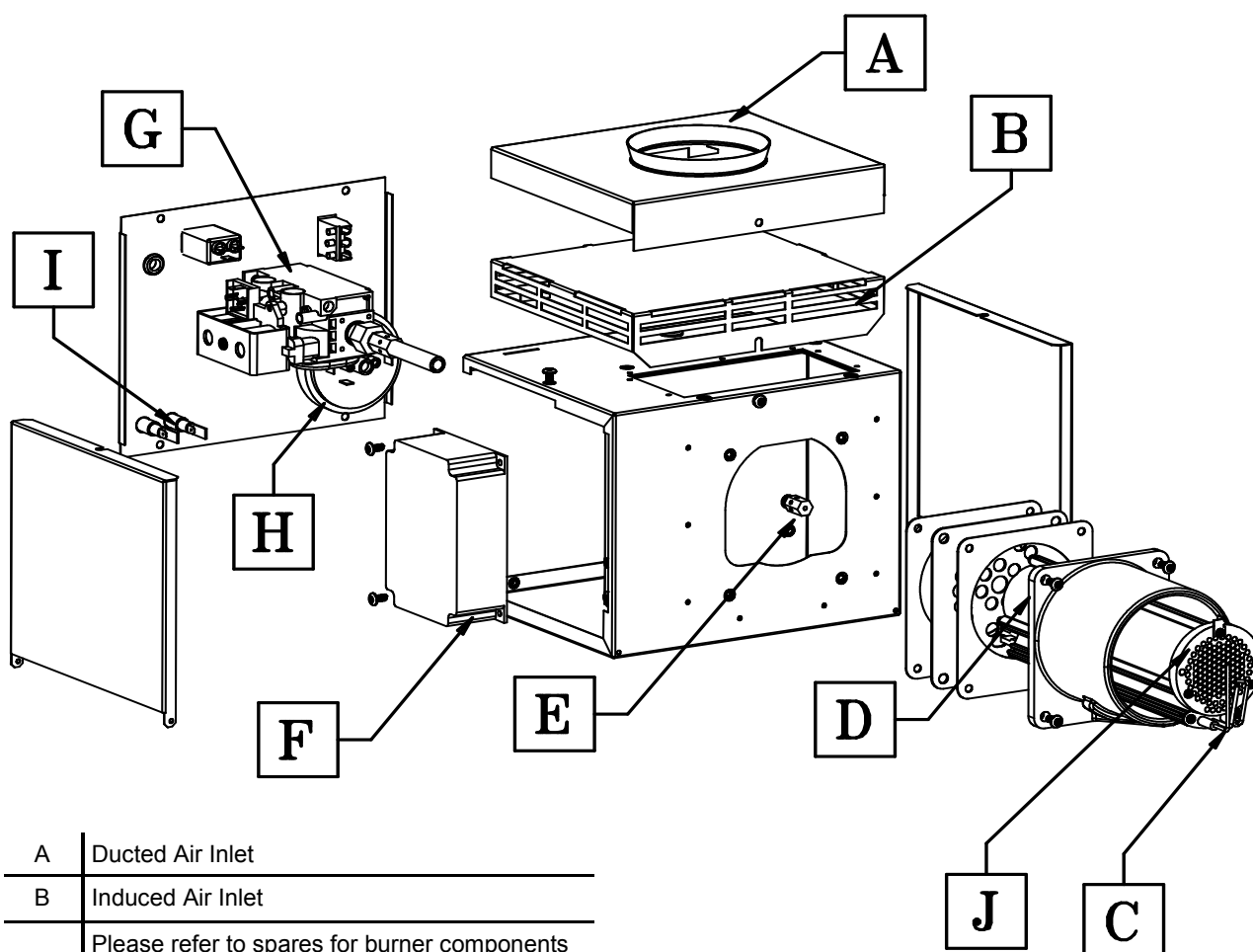
Wrench with 13mm Socket



Soft Brush

4.2 Burner Description.

Figure 18. Induced Burner: Models VS(A)UT, UH, LI, LH and DL

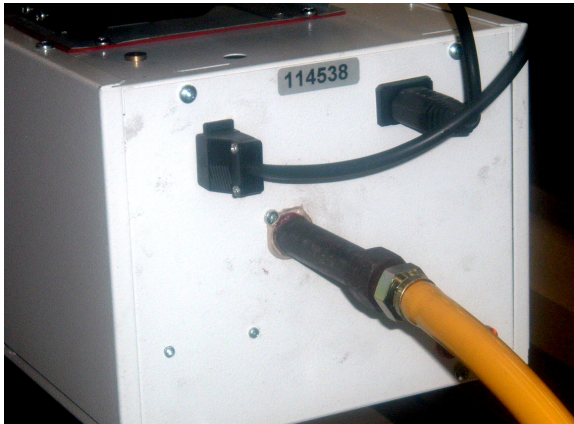


A	Ducted Air Inlet
B	Induced Air Inlet
	Please refer to spares for burner components
C	Ignitor Assembly
D	Extruded Burner Head
E	Multi Hole Injector
F	Ignition Controller

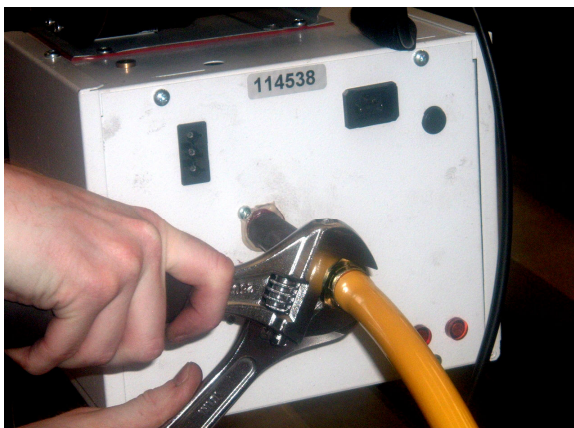
G	Gas Valve
H	Pressure Switch
I	Neon's (Red/Amber)
J	Pepperpot Head

4.3 Burner Removal (All Options)

! Step 1 Isolate mains electric and gas supplies. Unplug the fan and mains electricity connectors.



Step 2 Detach the gas supply as shown below, taking care to support the burner connection.



Step 3 On burners with a ducted air attachment slacken jubilee clip and remove the flexible hose from the fan.



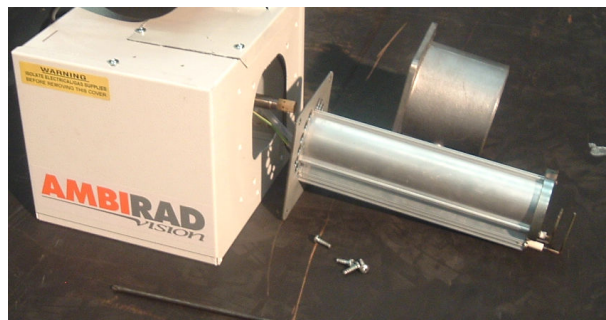
Step 4 Slacken the grub screw on the burner support casting using a 4mm Allen key to enable the burner to be removed from the radiant tube.



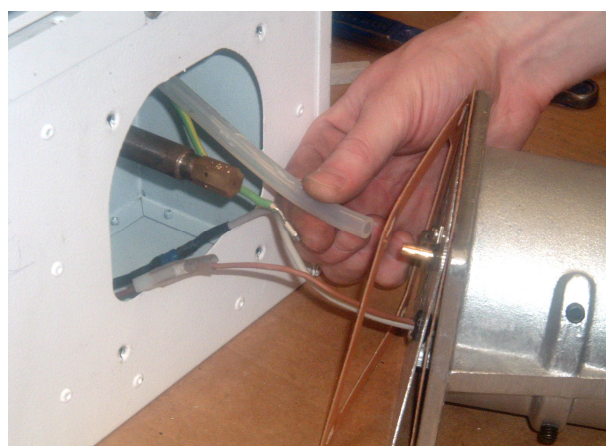
Step 5 Carefully remove the burner to prevent it or any components from falling to the ground and position the assembly in a safe area.

4.4 Burner Gas Injector Servicing

Step 1 Remove the burner support casting and gasket.



Step 2 The burner head assembly can be disconnected by separating the connectors of the ignition lead assembly and removing the pressure switch silicon tube.



Step 3 The gas injector can be inspected and replaced if contaminated or blocked.



i When replacing the gas injector use a 12mm spanner and ensure approved thread sealant is used.

Step 4 Refit the burner support casting and replace the gaskets to ensure effective sealing.

4.5 Burner Head and Electrode Servicing

Step 1 Check the pepper pot burner head for contamination. If necessary the head can be removed for cleaning of the inside of the burner head, see below.



Step 2 The pepper pot burner head can be replaced ensuring the 5 holes on the outer ring are aligned alongside the probes.



Step 3 The condition of the ignitor assembly can be checked for deterioration. However, we advise replacement at each service to ensure continued reliability.

Step 4 Detach the electrode assembly from the burner head by removing the two screws and separating the ignitor lead connectors.

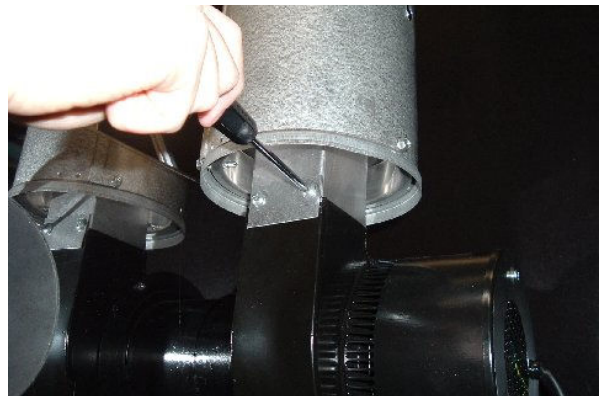
Step 5 Refit the electrode assembly.

Step 6 Check the positions and spark gap as shown in figure 19.

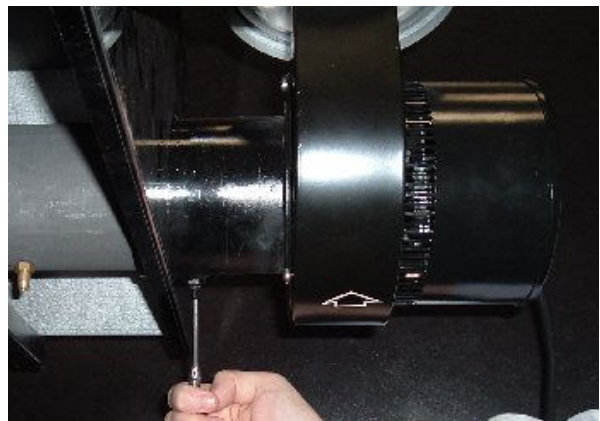
Step 7 The burner assembly is ready to refit after servicing the combustion fan and the radiant tube assembly.

4.6 Combustion Fan Assembly - Model VS(A) UT/VS(A)LI

Step 1 Loosen the clamp fitting on the flue.



Step 2 Loosen the 4mm grub screw.



Step 3 The combustion fan can now be detached.

Step 4 Remove the fan orifice plate spinning.



Step 5 Inspect the impeller and remove any dust with a soft brush.



Step 6 Remove any dust from fan scroll and from around the motor.

Step 7 Ensure the impeller rotates freely.

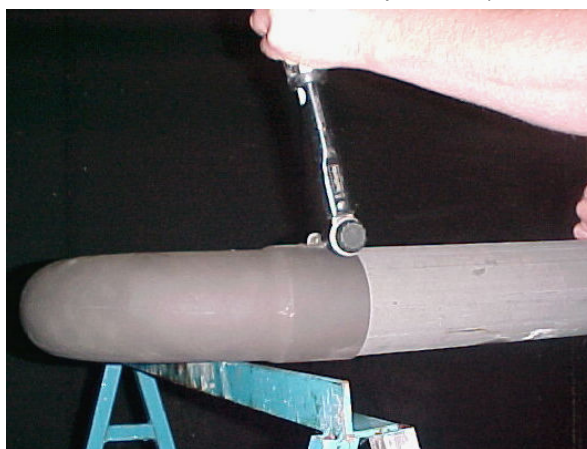
Step 8 Refit components.

4.7 Radiant Tube Servicing

Step 1 Brush any dust from the exterior of the tubes.

Step 2 Inspect the fan and burner tubes visually. If the tubes appear clean, skip to servicing the reflector.

Step 3 Remove the U bend (or fan / damper - LI / LH or condensate box - DL products)



Step 4 Withdraw the turbulators from the appliance. Carefully noting their condition and position. Replace turbulators if necessary.

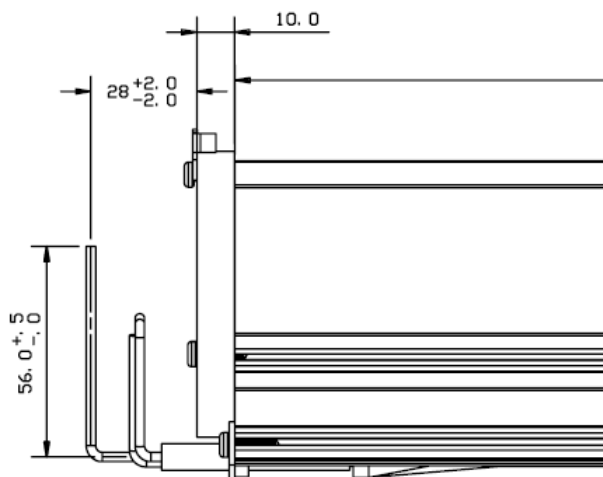
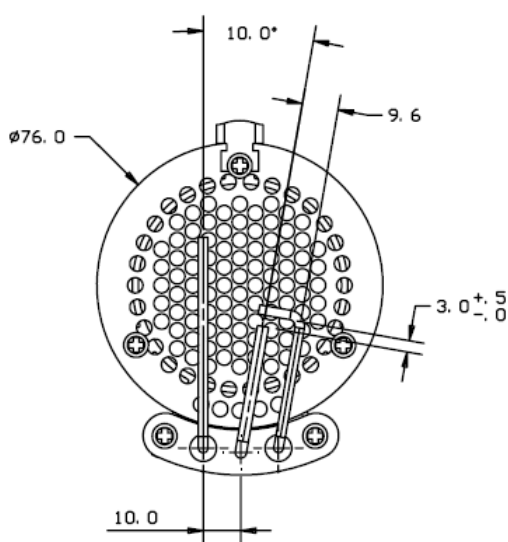
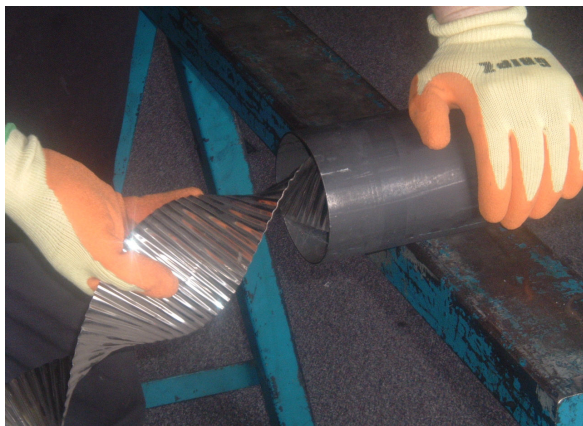


Figure 19. Burner head detail



Step 5 The turbulators should be cleaned with a soft brush.




Step 6 If required the interior of the tubes can then be cleaned using an industrial vacuum cleaner or by using long poles and a scraper.

Step 7 Refit components.

4.8 Reflector Servicing

The condition of the reflectors should be noted. If necessary the reflectors can be cleaned with a mild detergent.

 This can significantly improve the efficiency of the appliance.

4.9 Inspection of Flue

The flue needs to be inspected and cleaned if necessary or in accordance to the regulations of the country that the appliance is installed.

4.10 Re-commissioning After Service

After servicing of the heater has been undertaken, it will be necessary to re-commission the heater as detailed in Section 3 of these instructions.

5. Spare Parts.

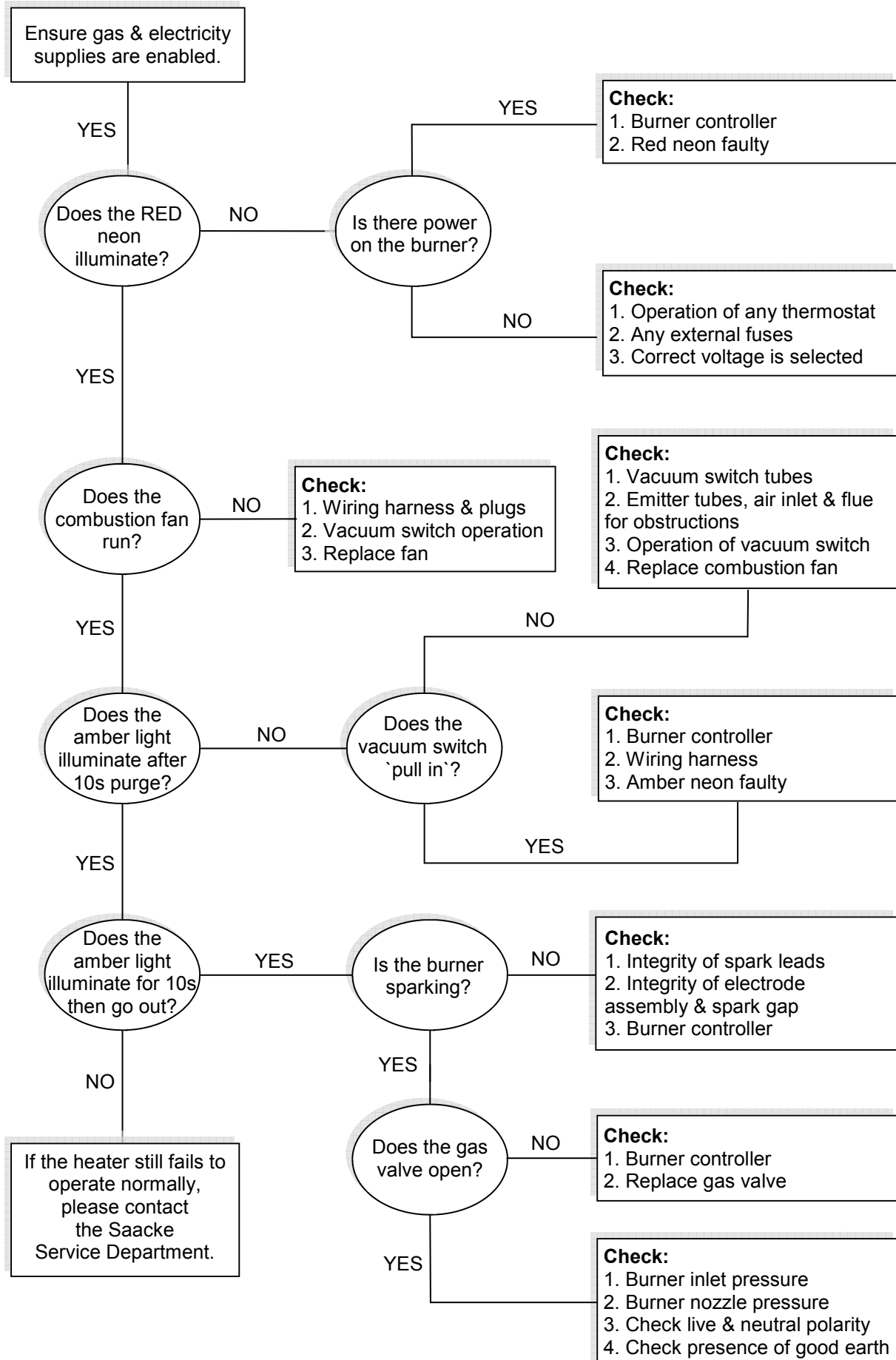
Required Spares

In order to aid troubleshooting and servicing we recommend that the components shown in this section should be stocked.

! *Note Any spare part components that are not approved by AmbiRad could invalidate the approval of the appliance and validity of the warranty.*

Item	Description	Part No.	Item	Description	Part No.
	Ignition Controller	2015S		Pressure Switch: Green	201508
	Nat Gas Valve Twin sol reg 220/240	201857		Amber Neon (Burner On)	2175
	Propane Valve Twin sol reg 220/240	201914		Red Neon (Mains On)	2180
	Pepperpot Head	200988		Combustion Fan	See Section 1.11
	Ignitor Assembly	201284		Gasket Set	201488
	Extruded Burner Head	200358	Cables:		
	Injector	See section 1.11		Spark Electrode (black)	900225-2
				Rectification lead (purple)	900225-3
				Earth lead (green/yellow)	900225-1
	Jet Carrier	200420		Flame Plate (VS35 Propane ONLY)	201571
	Flame Plate (VS15 ONLY Nat Gas & Propane)	201358			
	Flame Plate (VS25 Propane ONLY)	201854			

6. Fault Finding Guide.

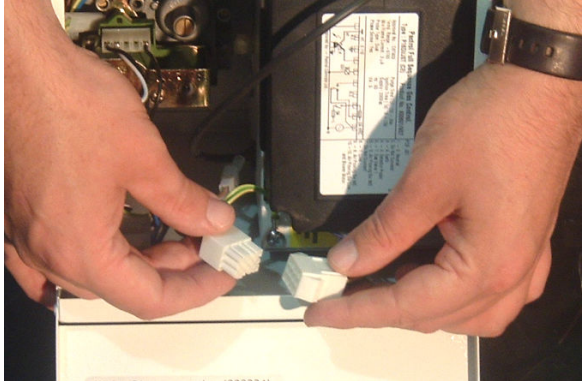


7. Replacing Parts.

7.1 Burner Controller Replacement

Step 1 Slacken screw in burner lid and open the right hand burner access door.

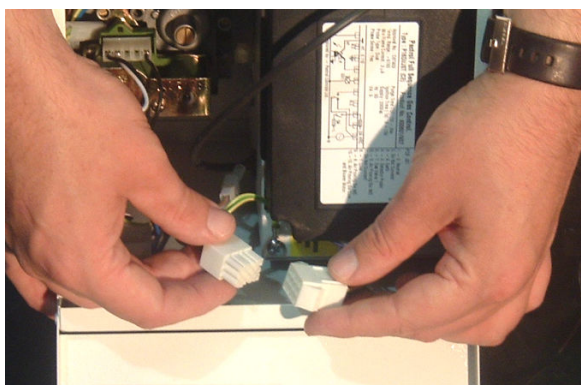
Step 2 Disconnect burner controller from the wiring harness.



Step 3 Disconnect the HT Lead from burner controller.



Step 4 Remove the two screws attaching the controller to the burner and remove.



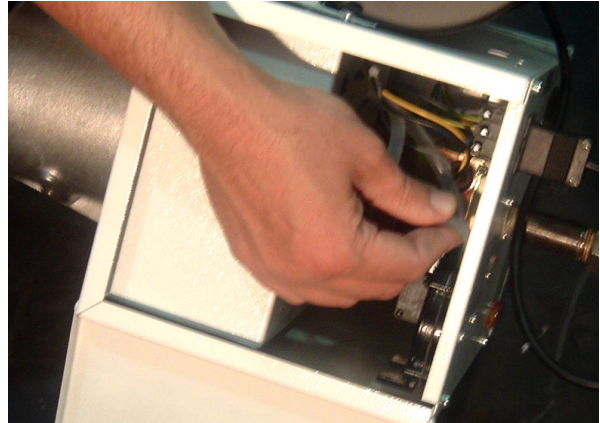
Step 5 Fit new burner controller.

Step 6 Refit HT leads and refit burner controller to wiring harness.

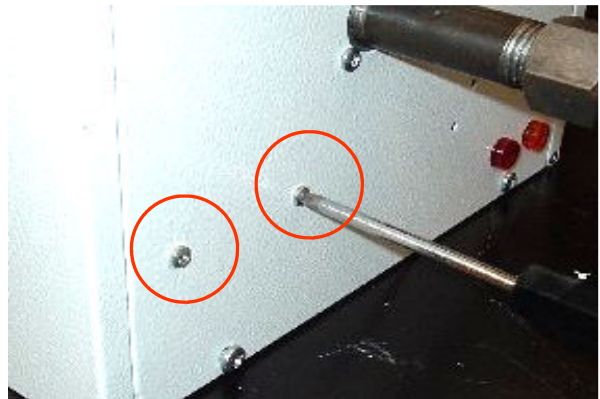
Step 7 Test product and close access door.

7.2 Air Pressure Switch Replacement

Step 1 Disconnect the two silicone impulse tubes and three wiring connections making note of replacement positions.

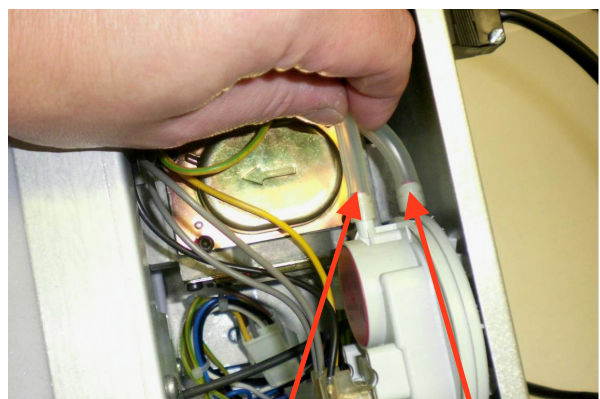


Step 2 Remove the two screws as shown below.



Step 3 The air pressure switch can now be removed.

Step 4 Fit the new air pressure switch ensuring the impulse tubes and electrical cables are connected as shown below.



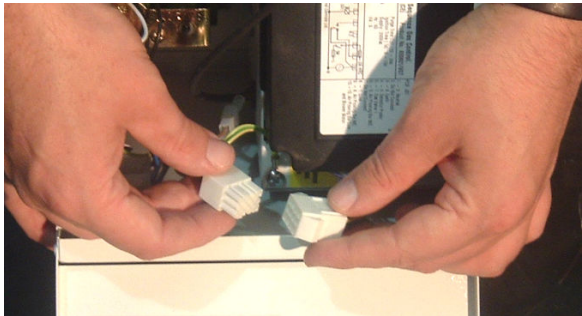
From orifice plate (negative).
From under burner lid (positive).

Step 5 Test product and close access doors.

7.3 Gas Valve Replacement

Step 1 Remove the burner assembly as described in section 4.3 Servicing.

Step 2 Open the right hand access door and detach the burner controller from the wiring harness.



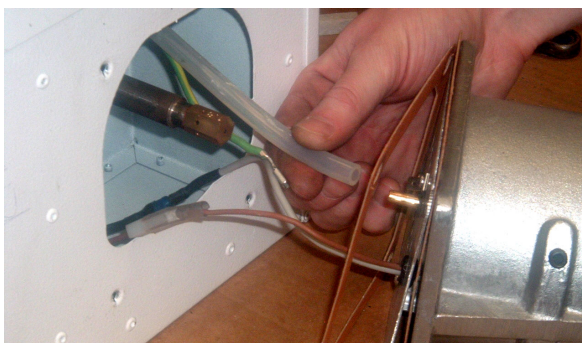
Step 3 Open the left hand access door and detach the impulse hoses from the air pressure switch.



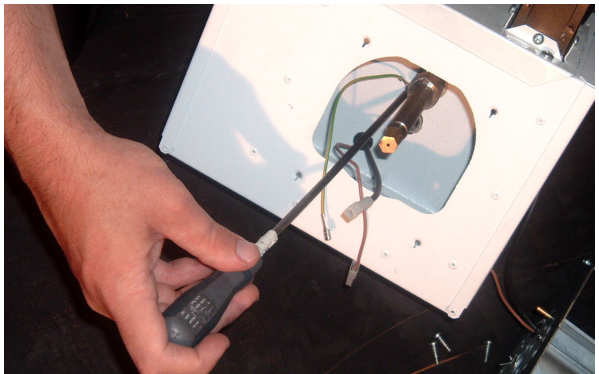
Step 4 Remove the 4 screws holding the burner head onto the burner assembly.



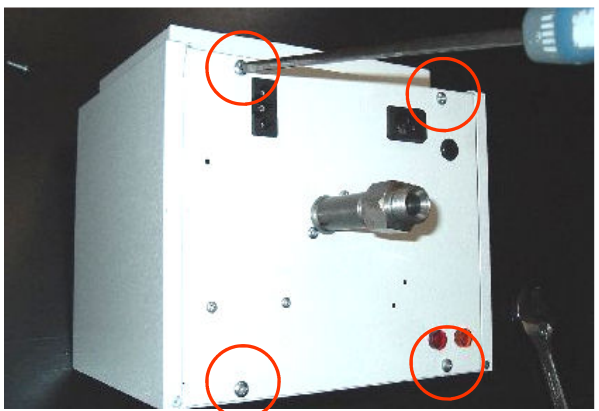
Step 5 The burner head can now be detached by disconnecting the impulse tube and the burner head wiring.



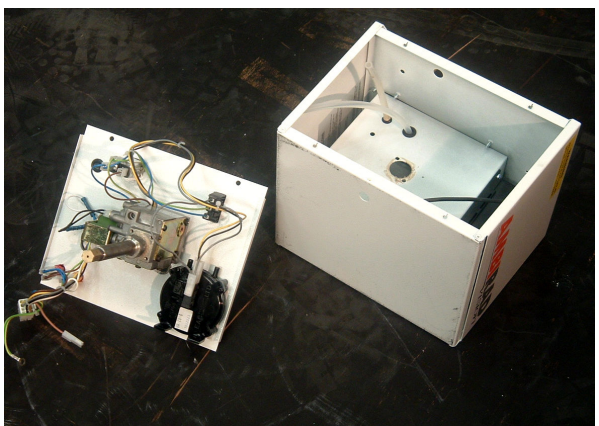
Step 6 Detach the two screws holding the front of the gas valve.



Step 7 Remove the four screws holding the rear burner plate in position.



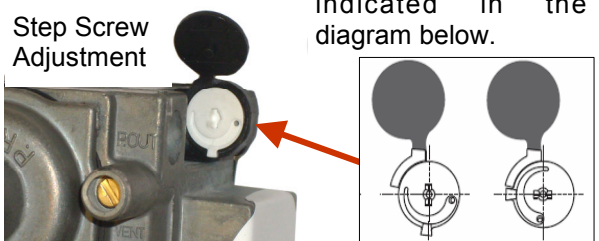
Step 8 Remove the rear plate.



Step 9 The jet carrier, gas inlet, and wiring harness can now be detached from the gas valve.

Step 10 (For Natural Gas burners ONLY). Ensure step screw is in the correct position as indicated in the diagram below.

Step Screw Adjustment



VS15/ VS25 VS35

Step 11 The two screws retaining the gas valve can then be removed.

Step 12 The gas valve can now be replaced.

Step 13 Refit all components in reverse order.

Step 14 Ensure step screw is in the correct

position as indicated in the previous diagram. (For Natural Gas burners ONLY).

Step 15 Set gas pressures to data badge or as per section 1.11 and ensure reliable burner performance.

Step 16 Test product and close access doors.

8. User & Operating Instructions.

8.1 To Start the Heater

1. Ensure gas supply is turned on.
2. Electrical supply to the controls is on.
3. Ensure that the controls are correctly set i.e.;

 - Clock is correctly set.
 - Heater program is correctly set.
 - Required room temp is correctly set

4. Once the heating controller 'calls for heat' power will be supplied to the heater(s). The red neon will then illuminate.
5. After a pre-purge period of 12 seconds the burner will ignite and the amber neon will then illuminate.
6. If lockout occurs switch off electrical supply and restart after 15 seconds.
7. If lockout occurs three times consecutively switch off and isolate the gas and electricity supplies.
Contact the Saacke Service Department.

8.2. To Switch Off Heater

1. Switch off electrical supply to the heater. The burner will stop and the fan will shut off.
2. If the heater is to be switched off for periods in excess of one week it is highly

recommended that both the gas and the electrical supplies are turned off.

8.3. Routine Maintenance between Service Intervals

After ensuring that the heater is cold and mains electric isolated, cleaning of the reflectors with a soft cloth and a mild detergent (non solvent based cleaners only) in water can be undertaken.

Additional removal of dust from the radiant tubes, burner and heat exchanger can be undertaken.

8.4 Frequency of Servicing

The manufacturer recommends that to ensure continued efficient and safe operation of the appliance, the heater is serviced annually by a competent person e.g. every year in normal working conditions but in exceptional dusty or polluted conditions more frequent servicing may be required.

The distributor offers a maintenance service. Details are available on request.

For Service requirements, please contact Saacke Australia Pty. Limited, PO Box 174, Pendle Hill, NSW, 2145.



SAACKE AUSTRALIA PTY.
LIMITED, PO BOX 174,
PENDLE HILL, NSW, 2145.

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Website www.saacke.com.au



AmbiRad is a registered trademark of AmbiRad Limited. Because of continuous product innovation, AmbiRad reserve the right to change product specification without due notice

APPENDIX 1

ASSEMBLY, INSTALLATION & SERVICING MANUAL FOR AMBIRAD VISION® VS RANGE OF RADIANT TUBE HEATERS

Installation Instructions for the VS School Ball Guard Kit

AmbiRad VISION® VS Series Radiant U Tube Heater Installation and Commissioning Instructions For the optional School Ball Guard Kit

IMPORTANT NOTICE!

THIS DOCUMENT SHOULD BE READ IN CONJUNCTION WITH THE 'ASSEMBLY, INSTALLATION & SERVICING MANUAL FOR AMBIRAD VISION® VS RANGE OF RADIANT TUBE HEATERS'.

THIS DOCUMENT IS ONLY RELEVANT TO THE ASSEMBLY AND INSTALLATION OF THE AMBIRAD VISION® VS15, VS25 AND VS35 HEATERS WITH THE OPTIONAL 'SCHOOL BALL GUARD KIT'

DUE TO CONTINUAL DESIGN IMPROVEMENTS THE HEATERS SHOWN MAY VARY TO THOSE SUPPLIED.

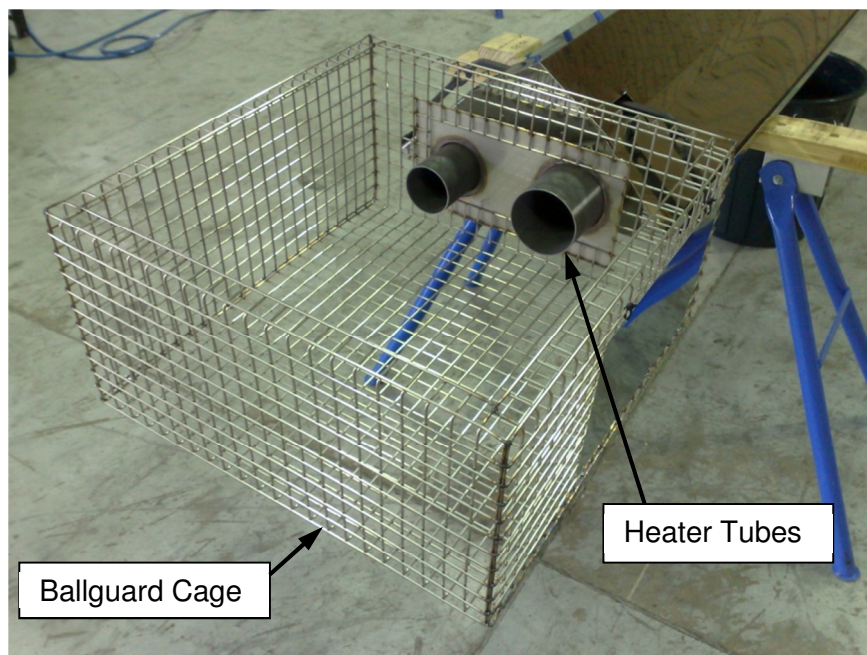
Introduction

AmbiRad VISION® VS Heaters can be supplied pre-assembled however the optional School Ball Guard Kit is supplied separately and needs some assembly prior to final positioning.

The main parts that need assembly comprise the burner, fan and burner cage.

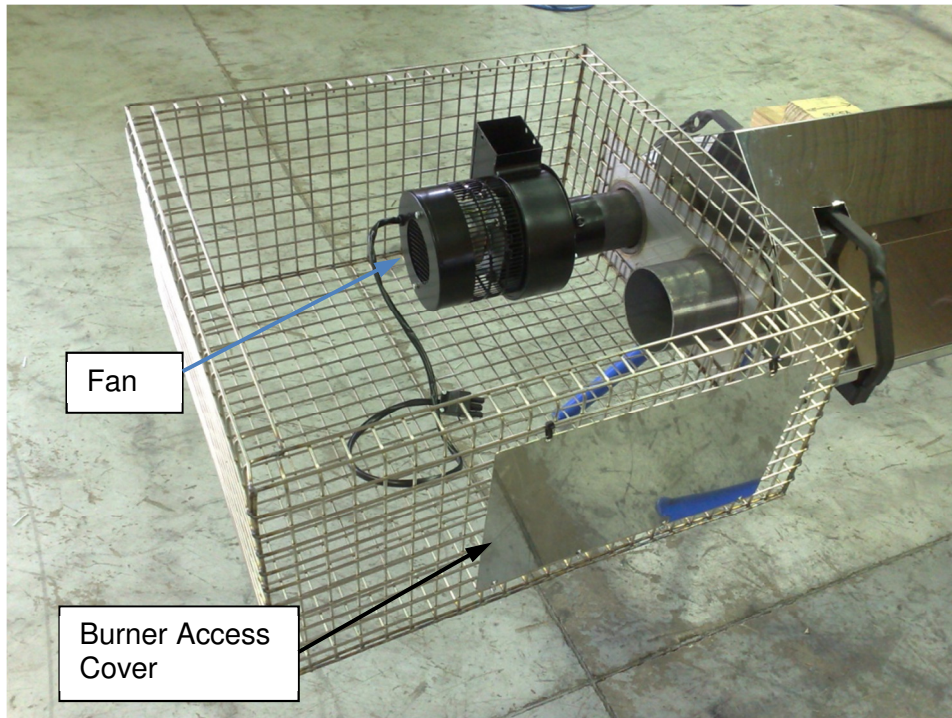
Installation of Burner, Fan and Burner Cage

Slide the burner cage, open side up, onto the two heater tubes. At this stage do not tighten the grub screws –

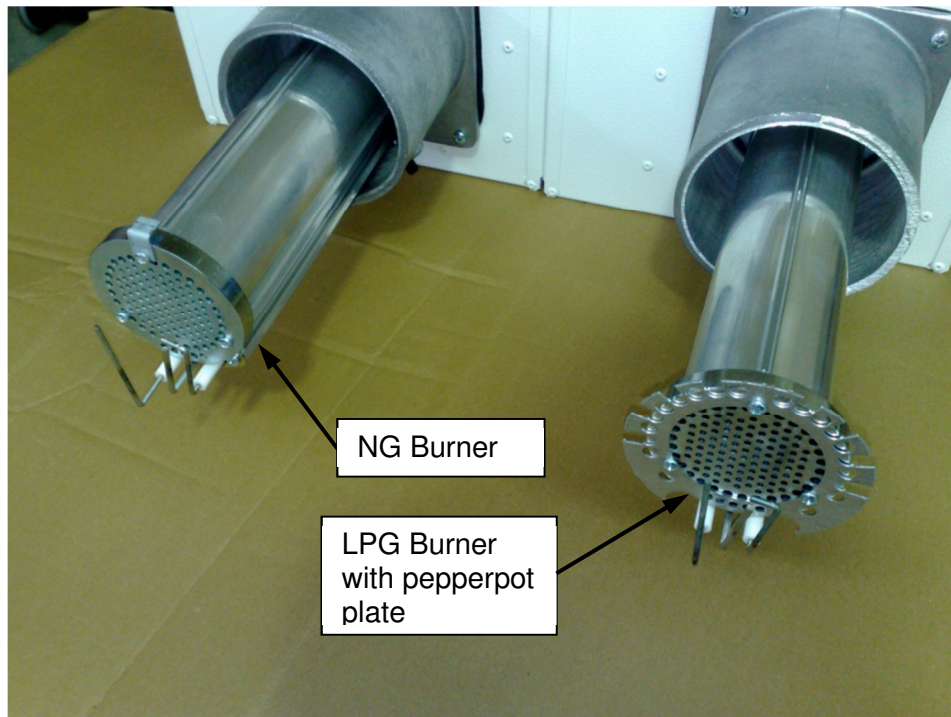


Fit the fan onto the left hand tube with square outlet upwards. Push fully onto the tube and tighten the grub screw –

Installation Instructions for the VS School Ball Guard Kit



The next stage is to insert the burner unit. It should be noted that the VS25 LPG burner is different to all the others. It has a 'Flame Plate' on the end as shown below.

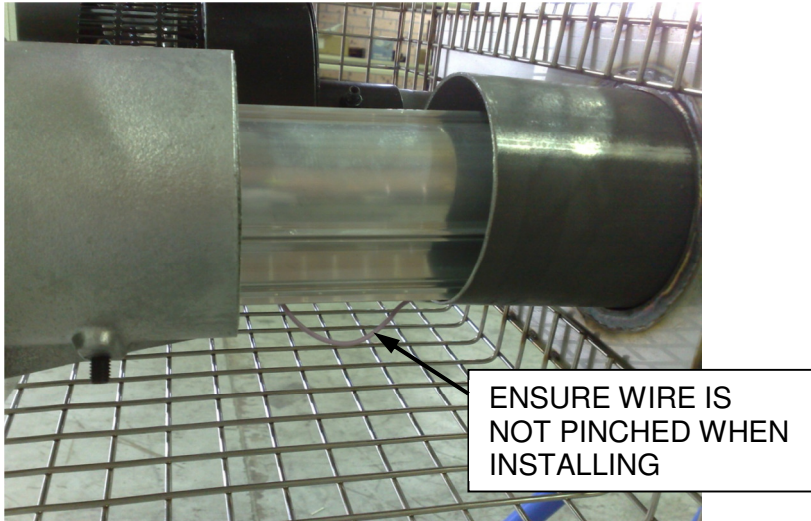


Installation Instructions for the VS School Ball Guard Kit

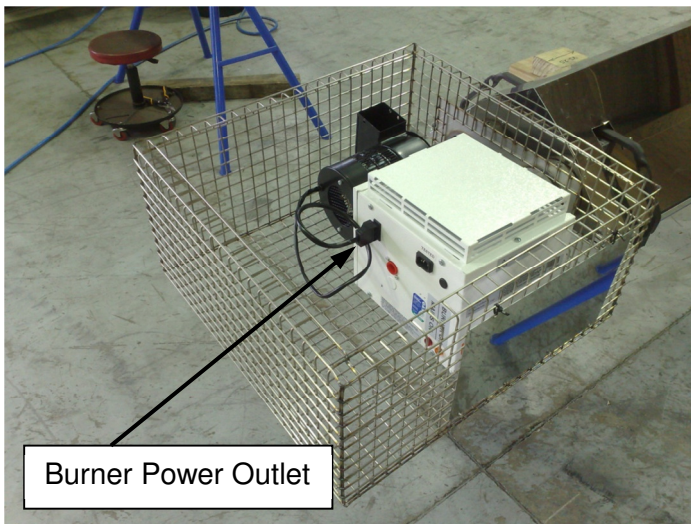
Slide the burner onto the right hand tube and push fully home.

CAUTION:

ENSURE WIRE DOES NOT GET PINCHED BETWEEN BURNER AND TUBE WHEN INSTALLING BURNER



Burner to be horizontal with covers to the top. Tighten the grub screw.



Move the cage back until it touches the burner flange, then tighten the grub screws to secure the cage.

Plug the Fan into the Burner Power Outlet.

Connect the electrical supply to the cord supplied and plug into the burner. Preferred method is a switched three pin plug socket within the cage. Electrical supply must be earthed. Current rating is 0.55 Amp inductive.

Connect the gas supply ½ inch BSP using the flexible hose supplied in the installation kit. An isolating valve is required adjacent to each heater, or within the cage.

If necessary the cage can be cut to create an opening for the incoming gas and electrical lines.

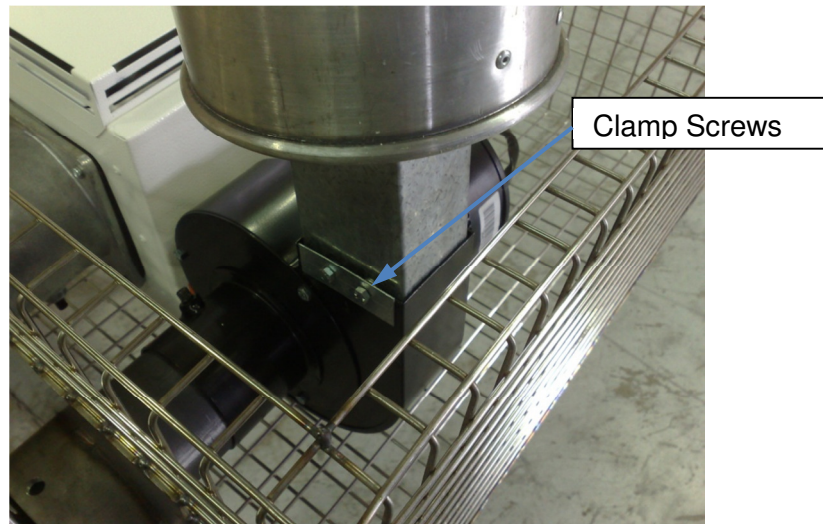
Installation Instructions for the VS School Ball Guard Kit

CAUTION:

ENSURE DISSIMILAR METALS ARE ISOLATED.

ENSURE THE ELECTRICAL WIRE AND GAS LINE DO NOT TOUCH ANY SHARP EDGES ON THE CAGE. USE FLEXIBLE CONDUIT TO ISOLATE IF NECESSARY.

Attach the draft diverter to the fan outlet and tighten the clamp screws

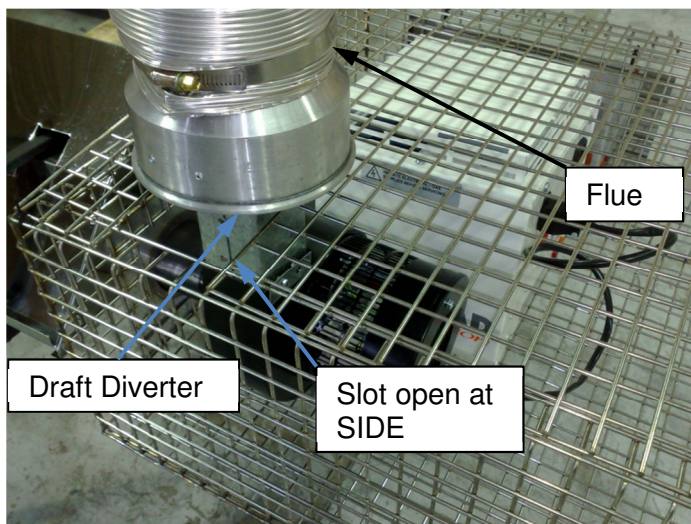


The cover is attached after commissioning. It slides in from the side and secured by tie wire or cable ties.

CAUTION:

ENSURE SLOT IS AT THE SIDE OF CAGE AS SHOWN SO THAT THE COVER FITS CORRECTLY

ENSURE YOU USE HOSE CLAMPS, TIE WIRE OR CABLE TIES TO SECURE THE LID



Flues and Cowl

Flues should be twin walled, 125mm ID in galvanized or stainless steel. AMBIRAD VISION® Heaters are approved for flued or unflued installation where the building

Installation Instructions for the VS School Ball Guard Kit

volume is sufficient. Refer AS5601 – 2004 Clause 5.12.8.2. Maximum gas input per cubic meter of space is 0.2 Mj/h or 0.4 Mj/h where the heaters are thermostatically controlled. A DECS / DTEI requirement is that heaters in school applications be flued.

It is recommended that a flexible connection be placed as close as practical to the draft diverter. An approved AGA Cowl is required to be fitted. Ensure joints in flue sections are sealed using heat resistant caulking. The maximum flue length is 9 meters with no more than two bends.

Ensure regulation natural ventilation into the building at low and high level.

Hanging

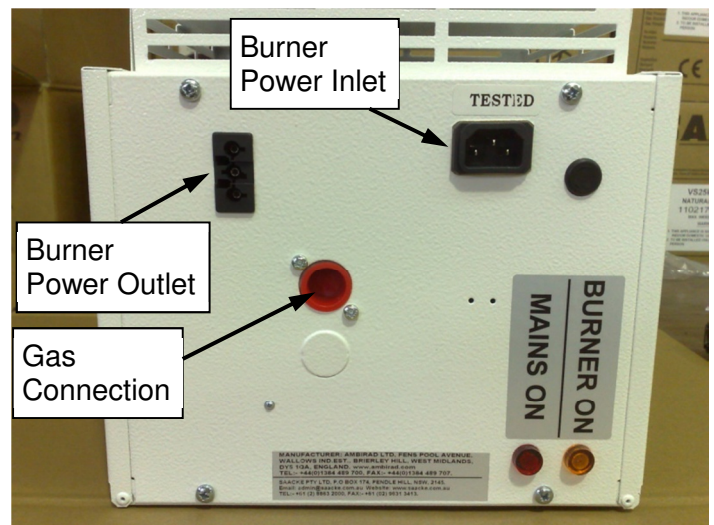
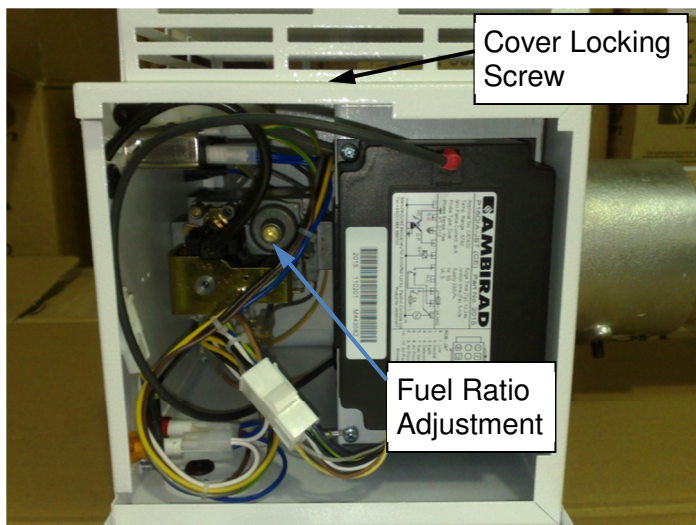
Heaters may be hung using chain or rods as supplied in our installation kit. Refer to the Heating Mounting diagram at the end of this manual to see the assembly layout.

Heaters must be hung with the U bend end of the heater approx. 10mm lower to ensure condensate is retained within the heater.

CAUTION:

ENSURE THERE IS NO TENSION ON THE ELECTRICAL OR GAS CONNECTIONS.

Commissioning



Heaters must be commissioned prior to operation. Inspect the heater and check they have been installed correctly.

CAUTION:

MAX GAS PRESSURE OF THE INTERNAL SOLENOID VALVE IS 6 KPA.

COMMISSIONING AND TROUBLESHOOTING FLOW CHARTS ARE IN THE 'ASSEMBLY, INSTALLATION & SERVICING MANUAL FOR AMBIRAD VISION® VS RANGE OF RADIANT TUBE HEATERS'.



Installation Instructions for the VS School Ball Guard Kit

Initial Operation

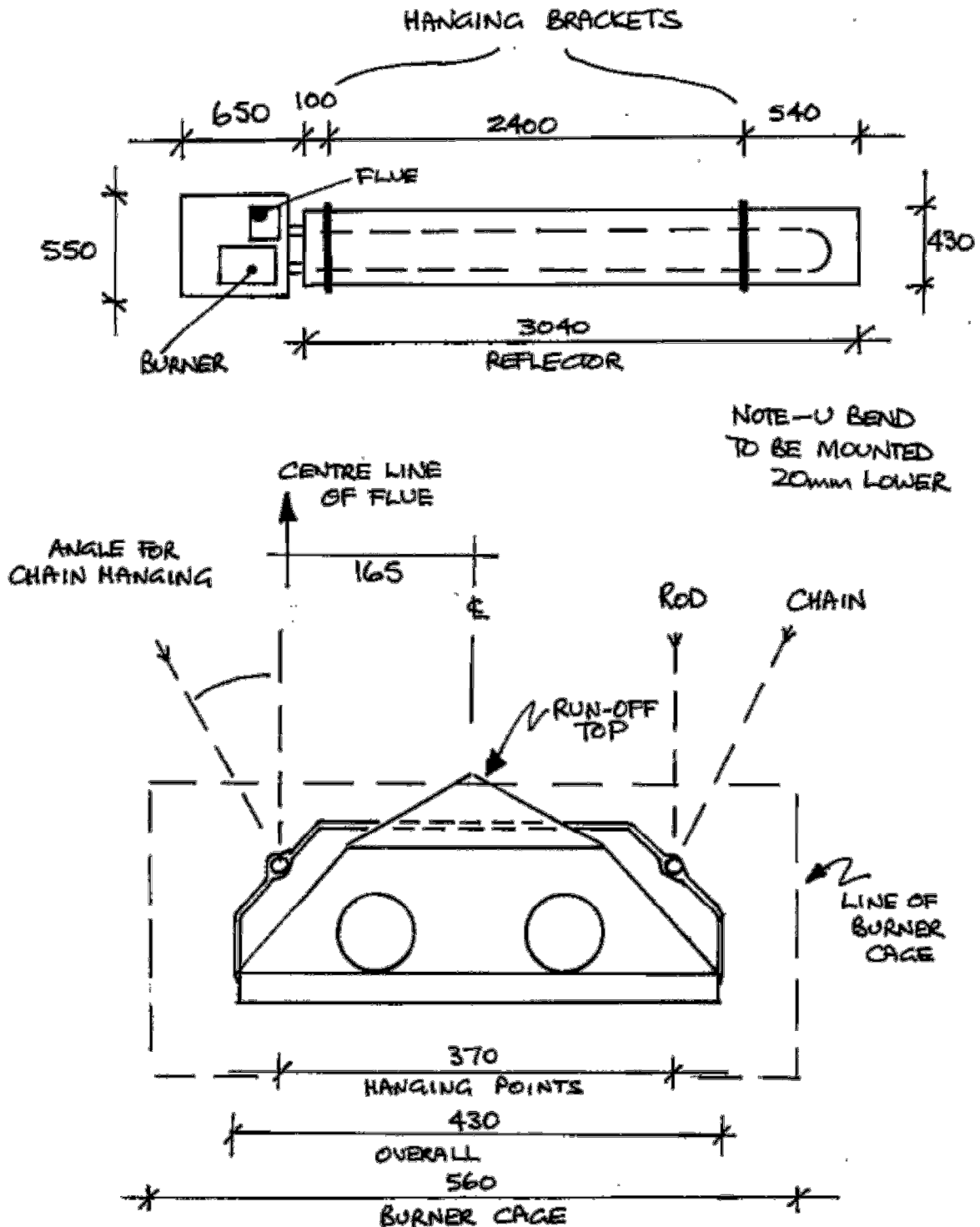
On initial operation some smoke will be emitted from the tubes for 5-10 minutes. This is normal. If necessary isolate smoke alarms.

Adjust Black Bulb Thermostat, if installed, to the required temperature.

Installation Instructions for the VS School Ball Guard Kit

AR 13 U TUBE PARTIALLY ASEMBELED SCHOOL VERSION DIMENSIONS

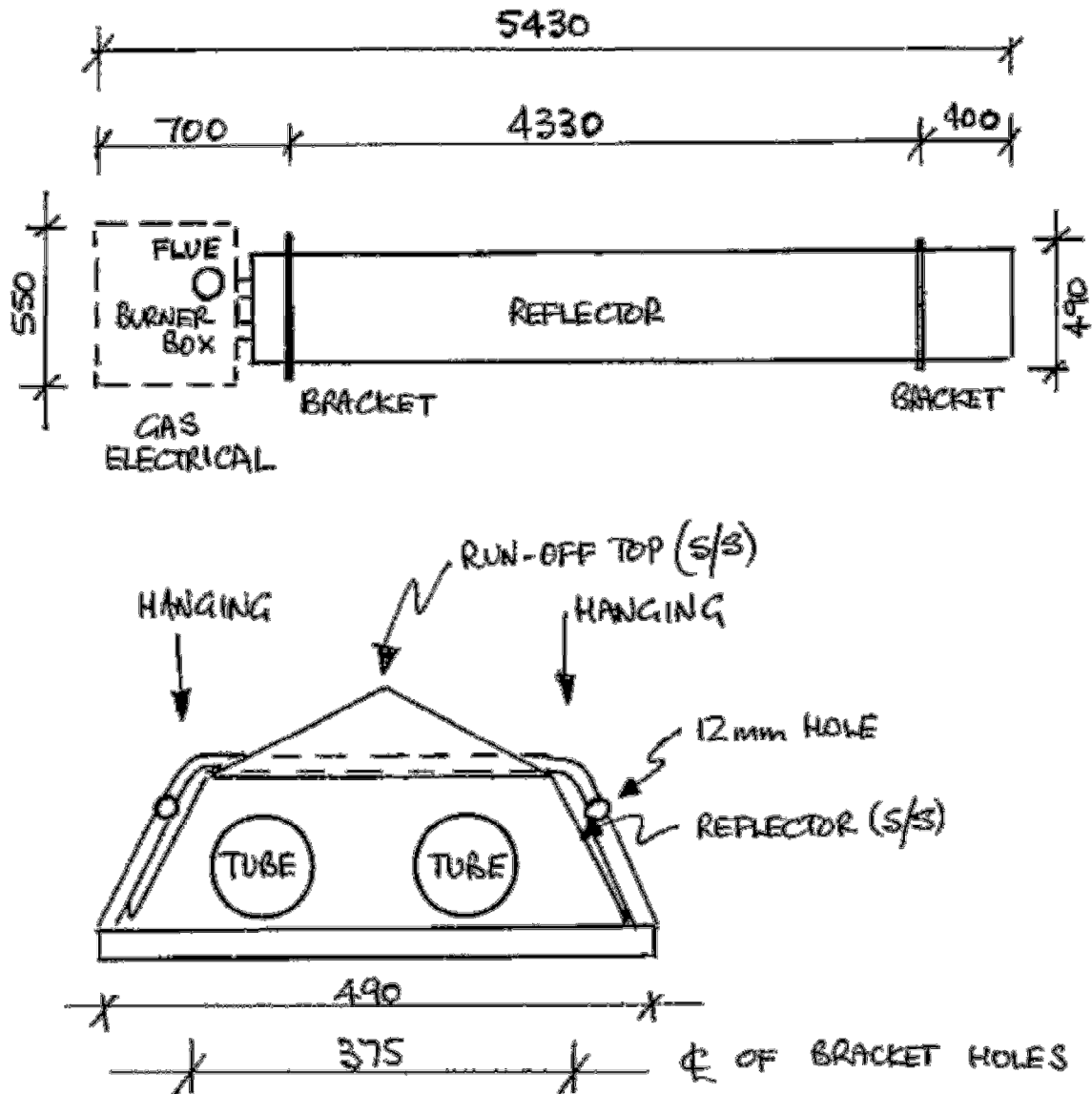
Note: for other Models please contact SAACKE



Installation Instructions for the VS School Ball Guard Kit

S25 U TUBE, PARTIALLY ASSEMBLED, SCHOOL VERSION DIMENSIONS

Note: for other Models please contact SAACKE

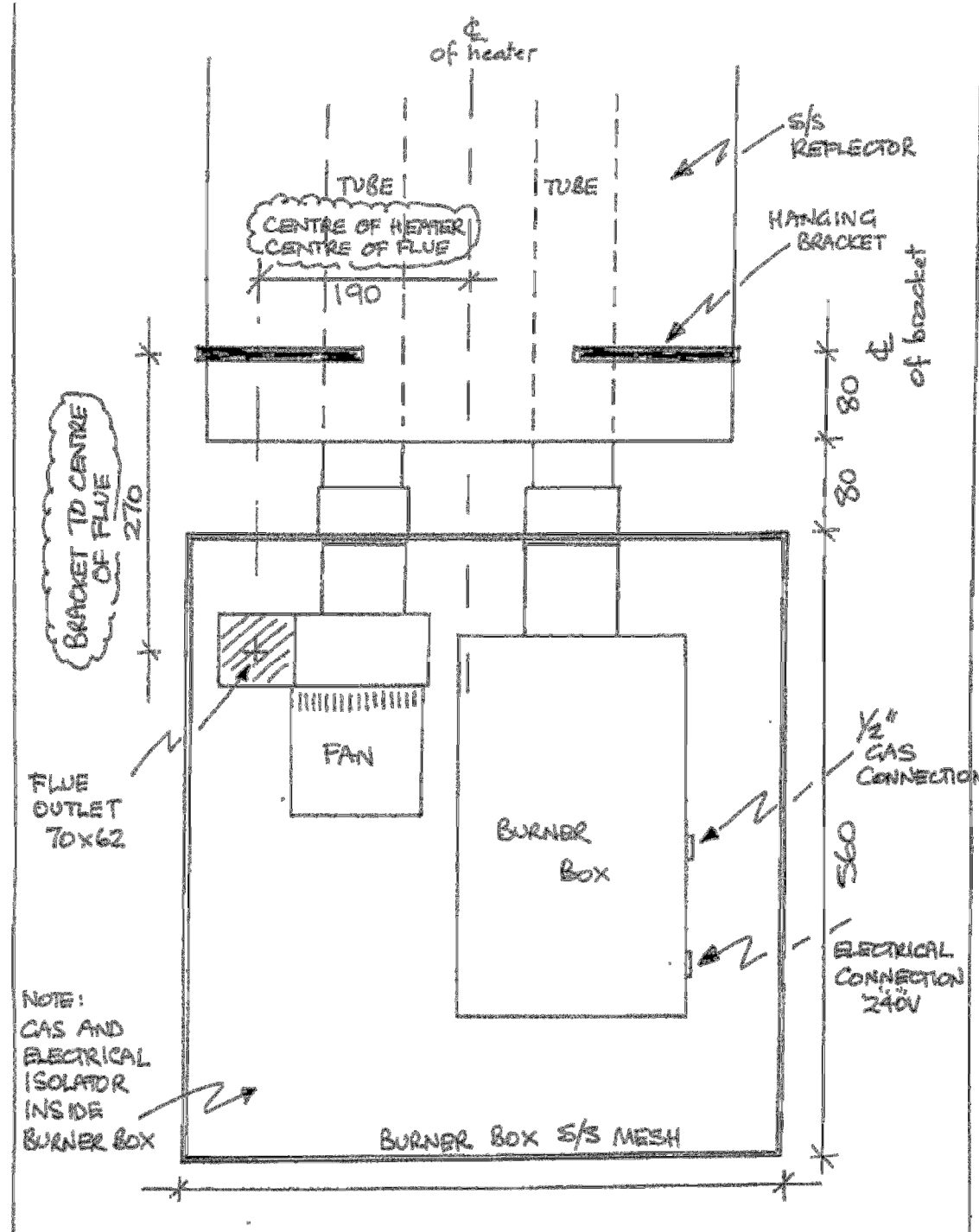


* NOTE - HEATER TO BE INSTALLED WITH BURNER
END 20mm HIGHER THAN 'U' BEND END

Installation Instructions for the VS School Ball Guard Kit

VS25 BURNERS /FAN BOX DETAIL LOCATION OF FLUE

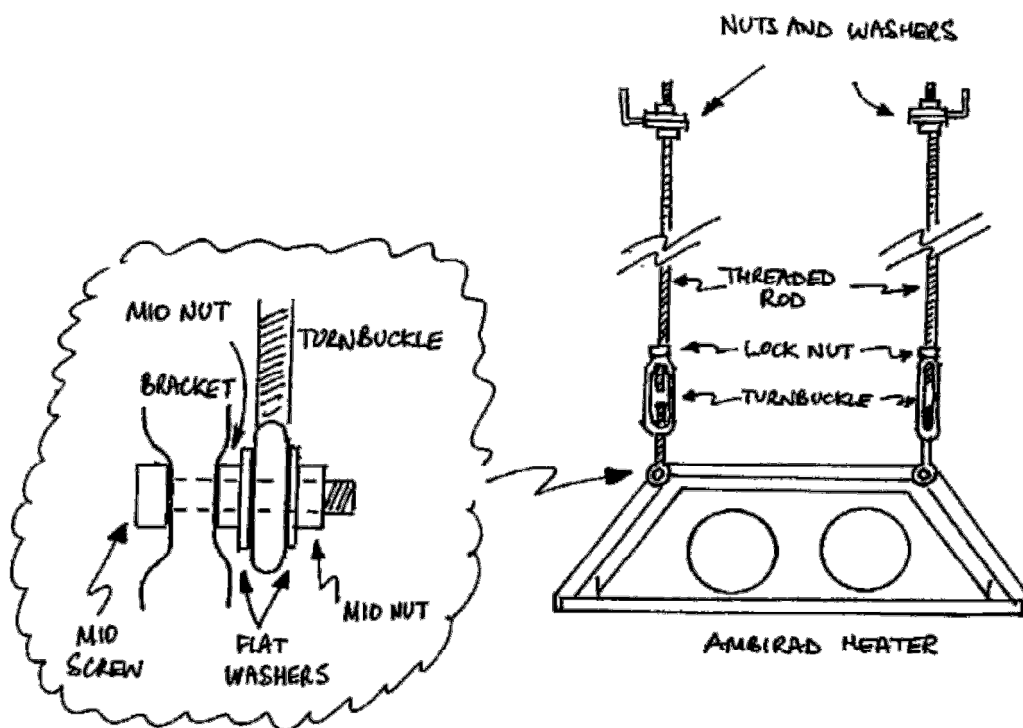
Note: for other Models please contact SAACKE



Installation Instructions for the VS School Ball Guard Kit

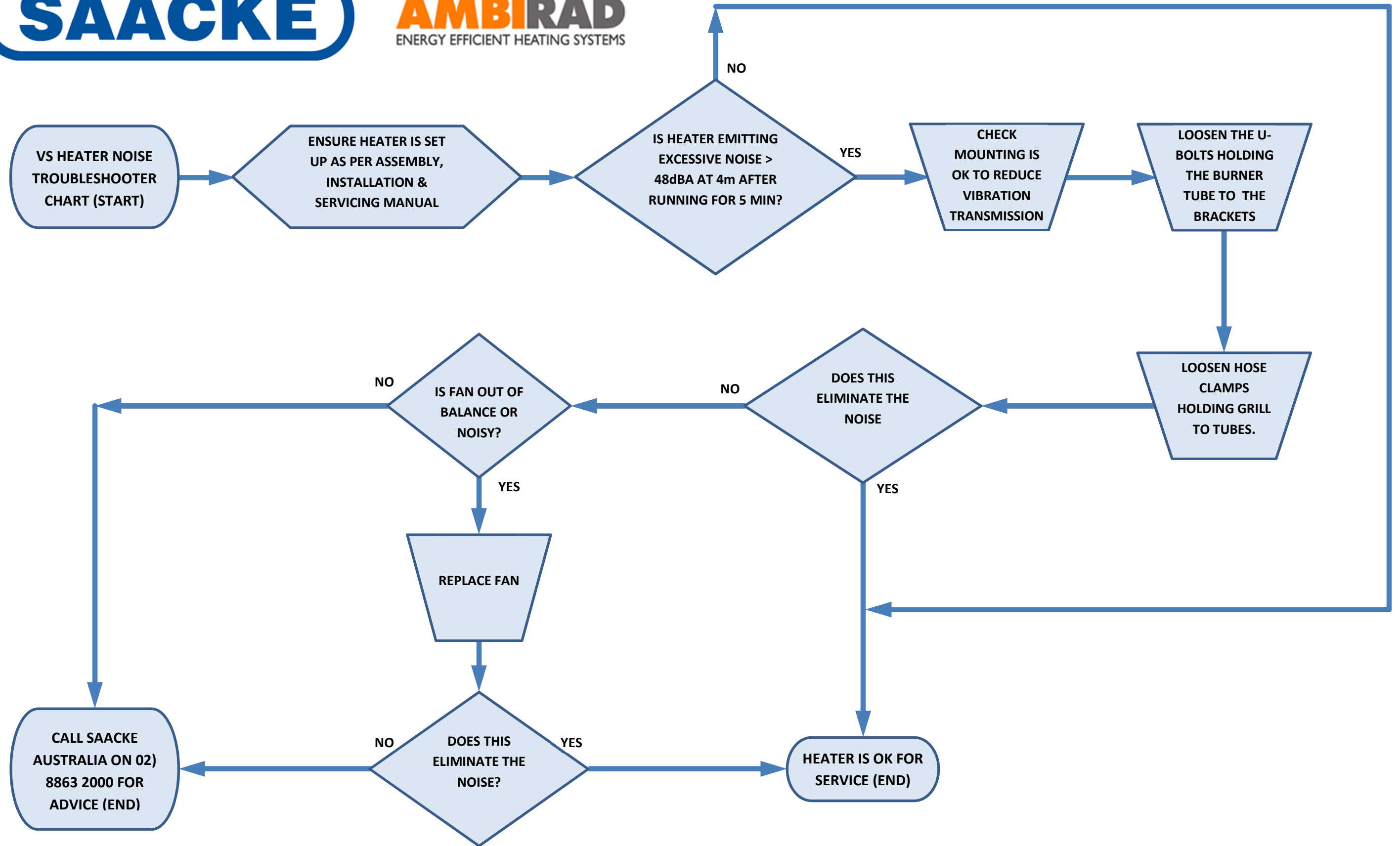
Ambirad VS25 Radiant U Tube Heater Installation Kit with Hanging Rods or Chains Contents

- 4x Threaded Rod M10 x 3000 or Chain kit
- 4x M10 Turnbuckles
- 4x M10 x 40 Zinc Plated Hex Head Screws
- 20x M10 Zinc Plated Nuts
- 16x 10mm Flat washers
- 1x 600mm x ½ BSP Gas Hose
- 4x Galvanised angle brackets



APPENDIX 2

VISION® HEATER BALL GUARD ASSEMBLY INSTRUCTION



APPENDIX 3

ABEY GAS FLEX FLUE BROCHURE

A man wearing a black cap with a blue stripe and an orange safety vest over a dark blue polo shirt is looking up and holding a large roll of silver, flexible gas flue. The background is a blurred wooden structure.

ABEY'S TWIN WALL FLEXIBLE GAS FLUE



THE TRADESMAN'S CHOICE

ABEY'S NEW FLEXIBLE GAS FLUE

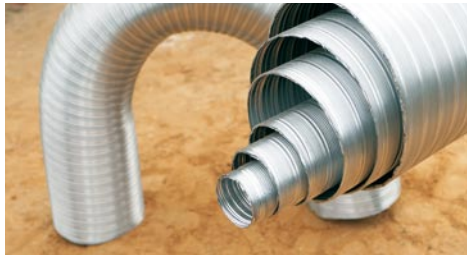


Easier to install

Installing galvanised gas flues can be a real pain. Are fiddly and time consuming jobs potentially costing you more than they are worth, especially when roof obstructions get in your way?

Don't stress – Abey's new flexible gas flue has come to your rescue. A low cost flexible gas flue that's better, faster and easier to install.

Abey flexible, Twin Wall Gas Flex is around the same price as the galvanised solution you are currently wrestling with, conforms with AS 5601-2004 for flue temperatures up to 300°C to suit new energy efficient appliances and is available in 75-300mm diameter sizes.



Flexibility saves you time and money

A flexible solution will save you time. Forget those expensive prefabricated elbows – simply bend Abey's Gas Flex around any roof obstruction to create any offset required.

Results are instant and easy – what could be simpler?

What could be faster?

Installations in half the time for around the same cost as you are paying for gal.

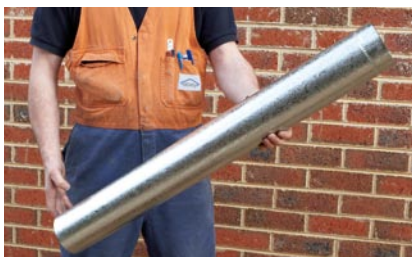


Gal pipe is single skin... Abey Gas Flex is twin wall

- ✗ Gal pipe is prone to corrosion failure from vapours and gasses
- ✓ Abey 'aluminium' Gas Flex is corrosion resistant
- ✗ Gal pipe is rigid and often hard to fit
- ✓ Abey Gas Flex is flexible and friendly to use
- ✗ Single skin gal pipe makes an inefficient flue being slow to prime
- ✓ Abey's 'twin wall', aluminium Gas Flex is efficient and fast to prime

GIVE GAL THE FLICK... ABEY DOES THE TRICK IN HALF A TICK





QUICK & EASY TO USE

Abey's twin wall flexible gas flue system helps you finish those difficult jobs fast.

- Abey Gas Flex is available in easy to use 1.5m lengths (75 – 300mm diameter sizes)
- Simple to use connectors help you make the length you need. Just push Gas Flex into joiner and fix with galvanised screws
- Connect Gas Flex to appliance with hose clamp
- Abey Gas Flex can be easily bent around roof obstructions – Ensure adequate fire protection clearance from combustible materials (25mm)
- Above roofline – Feed Abey Gas Flex through to top of rigid flue and fix into place with screws/rivets (3 sides)
- Fix and flash Abey's galvanised pipe to the roof (as per sec 5.13.6 AS5601-2004 for flue terminal permissible locations)
- Fit and fix flue cowl
- Inspect flue, cowl and pipes for clearances and any obvious damage before testing appliance

Disclaimer: Gas flues should only be installed by authorised persons and in accordance with manufacturers instructions, local gas fitting regulations, municipal building codes, AS 5601-2004, gas installations and any other statutory regulations. The rigid flue pipe mentioned is classified as a single wall metal flue and clearances to combustible materials must be in accordance with table 5.6 in AS5601-2004.

HERE'S ALL YOU NEED

AGA CERTIFIED

CODE NO	SIZE	BOX QTY
75GF4K	75mm Twin Wall Gas Flue Kit*	1
100GF4K	100mm Twin Wall Gas Flue Kit*	1
125GF4K	125mm Twin Wall Gas Flue Kit*	1

* Kit contains: 4m of pipe, 1 x Cowl, 1 x 900 Solid Gal Flue & 1 x Clamp

- Available in 1.5 metre lengths
- 75-300mm diameter



Abey Twin Wall Gas Flex

75GF	75 x 1500mm Twin Wall Gas Flex	6
100GF	100 x 1500mm Twin Wall Gas Flex	6
125GF	125 x 1500mm Twin Wall Gas Flex	6
150GF	150 x 1500mm Twin Wall Gas Flex	4
200GF	200 x 1500mm Twin Wall Gas Flex	4
250GF	250 x 1500mm Twin Wall Gas Flex	2
300GF	300 x 1500mm Twin Wall Gas Flex	2



Abey Gas Flex Connector

75FPA	75mm Twin Wall Gas Flex Connector	6
100FPA	100mm Twin Wall Gas Flex Connector	6
125FPA	125mm Twin Wall Gas Flex Connector	6
150FPA	150mm Twin Wall Gas Flex Connector	4
200FPA	200mm Twin Wall Gas Flex Connector	1
250FPA	250mm Twin Wall Gas Flex Connector	1
300FPA	300mm Twin Wall Gas Flex Connector	1

- Available in 1.5 metre lengths
- Unique size to fit 75-300mm diameter



Abey Twin Wall Cowl

75FPC	75mm Twin Wall Cowl	6
100FPC	100mm Twin Wall Cowl	6
125FPC	125mm Twin Wall Cowl	6
2103	150mm Twin Wall Cowl	1
2063	200mm Twin Wall Cowl	1
2064	250mm Twin Wall Cowl	1
3306	300mm Twin Wall Cowl	1

- Unique size to fit 75-300mm diameter



Abey Galvanised Flue

GF75	75 x 900mm Galvanised Flue	6
GF100	100 x 900mm Galvanised Flue	6
GF125	125 x 900mm Galvanised Flue	6
GF150	150 x 900mm Galvanised Flue	1
GF200	200 x 900mm Galvanised Flue	1
GF250	250 x 900mm Galvanised Flue	1
GF300	300 x 900mm Galvanised Flue	1

ABEY AUSTRALIA PTY LTD

57-81 ABEY RD, MELTON 3337

VIC 03 9747 7777 | **NSW** 02 8572 8572 | **QLD** 07 3805 7000

SA 08 8443 5677 | **WA** 08 9446 8255 | **TAS** 03 6272 7386

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THE TRADESMAN'S CHOICE

APPENDIX 4

ABEY ROOFTITE INSTALLATION INSTRUCTIONS

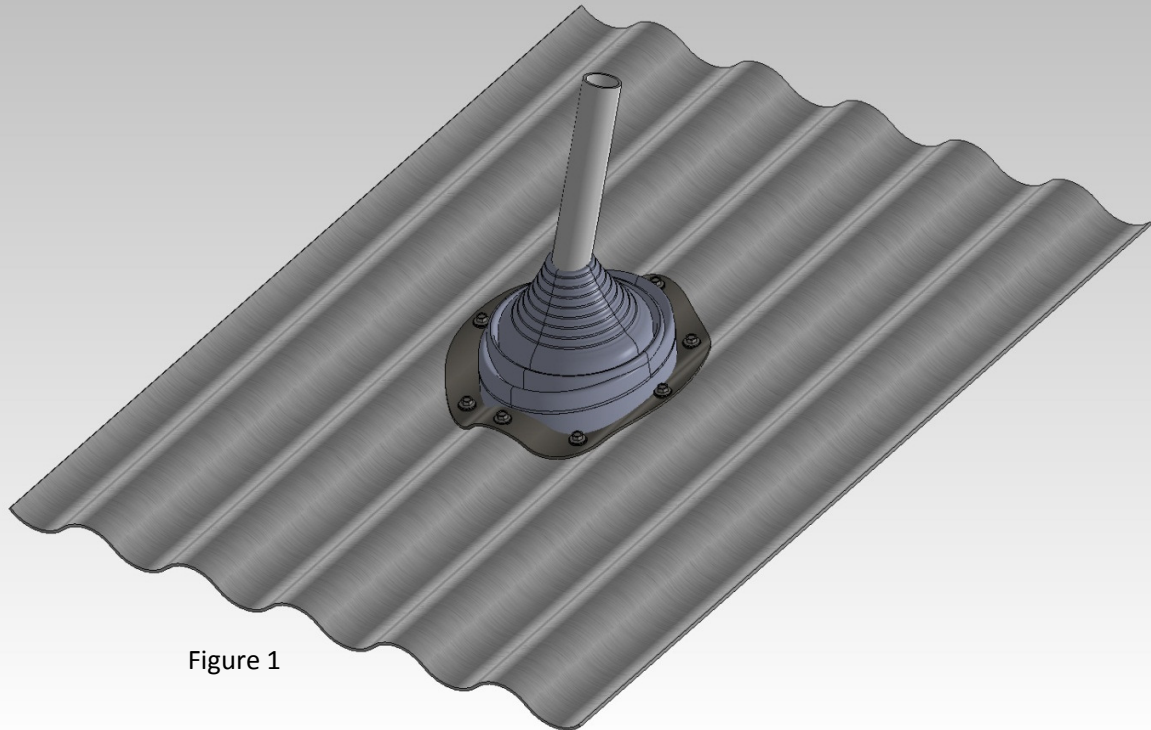


Figure 1

Pipe Size Range
0 – 35mm
0 – 65mm
50 – 155mm
150 – 255mm
240 – 375mm

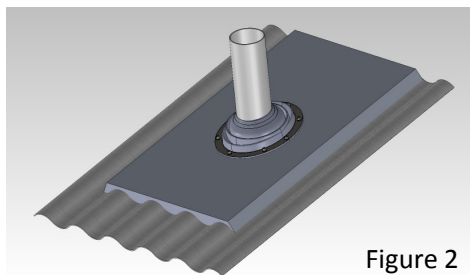


Figure 2

Installation Instructions

1. Select the correct size and type of Rooftite pipe flashing for the job – see sizing details on side of Rooftite
EPDM - for pipe surface temperature of 100°C – intermittent 135°C
Silicone - for pipe surface temperature of 180°C – intermittent 260°C
2. Cut the cone to the corresponding outside pipe diameter. DO NOT use a knife to cut – use scissors or sharp snips to ensure NO “nic’s” along the cut edge.
Note: There may be different to the common name of the pipe size: eg. 50mm pipe could be 60mm OD including wall thickness)
3. Slide the flashing down the pipe (water can be used on the inside of the Rooftite as a lubricant)
4. Form the Rooftites aluminium fixing ring onto the roof profile and mark around base with soft tip marker – DO NOT use a pencil or sharp object as this may scratch through the protective layer on the metal (both paint and Zinc)
Note: Water must not pond on upstream side of flashing – DO NOT block across full corrugation. See figure 2
Note: With a large profile corrugation and small Rooftite size, it may be an advantage to turn flashing with major diameter of oval across corrugation to ensure ease of fixing
5. Lift Rooftite up the pipe to apply silicone sealant surface onto roof inside mark
Note: If Rooftite is used on a pipe with a seam – entire length of seam must be sealed and silicone sealant must be applied between Rooftite top lip and pipe
6. Lower Rooftite onto roof and fix in place beginning at upstream edge and then downstream edge – working around circumference correspondingly. Sufficient fixings must be used to apply pressure to entire base between Rooftite and silicone sealant. Fixings used must be non-corrosive and self-sealing (eg. self-tapping screws with neoprene washer under heads or self-sealing rivets with additional silicone sealant over head)
7. To remove excessive distortion of EPDM rubber, slide top lip of Rooftite up pipe

ABEY ROOFTITE

FREQUENTLY ASKED QUESTIONS

Q

Can the Rooftites be painted?

A

Yes they can be painted with 100% acrylic paint

Q

What is the maximum roof pitch?

A

Roofrites can accommodate 45° or greater depending on the roof profile

Q

What type of Sealant do I use?

A

We recommend a neutral cure, alcohol-free, low modulus silicone sealant

Q

When do I need to install onto a soaker flashing?

A

If the flashing is going to cause water to pond in the corrugations behind the flashing - see figure 2



THE TRADESMAN'S CHOICE

APPENDIX 5

AUSTRALIAN GAS ASSOCIATION APPROVAL FOR VISION® HEATERS



AGA CERTIFIED PRODUCT

JAS-ANZ



www.jas-anz.org/registration

Certificate Holder:	AMBIRAD LTD
ABN/ACN No. (if applicable):	N/A
Manufacturer:	Ambirad Ltd
Agent (if applicable):	Saacke Australia Pty Ltd
Type of Appliance:	Overhead Radiant Tube Gas Heaters
Model No. & Description: (Refer www.aga.asn.au for more details)	AMBIRAD, SAACKE VISION SERIES VS25UTNAU, VS25UTPAU, VSA25UTNAU, VSA25UTPAU, VS25UHNAU, VS25UHPAU, VSA25UHNAU, VSA25UHPAU, VS15UTNAU, VS15UTPAU, VS35UTNAU, VS35UTPAU <i>Model number may include optional suffix(s) e.g. DA, LO, WS, UH, UT, LH, LI</i>
Relevant Standard(s):	AS 4643 - 2007
Gas Type(s):	Natural & Propane

This is to certify that the particular **APPLIANCE** specifically described herein and supplied to The Australian Gas Association (hereafter called the AGA) by the Certificate Holder named above has been subject to "type-testing" and assessed by the AGA to comply with the requirements of the AGA's Product Certification Scheme for Type Tested Gas Products.

This Certificate is issued on the express conditions that:

- The Certificate Holder undertakes to comply with the Rules Governing The AGA's Product Certification Scheme (hereafter called the Rules Governing);
- The Certificate Holder undertakes to affix the AGA's Certification Badge (an image of which is endorsed hereon) to every appliance of the above-named model(s) throughout the currency of the certification;
- This Certificate remains the property of the AGA; and
- The AGA reserves the right to cancel this Certificate in accordance with the Rules Governing, and in such an event the Certificate Holder undertakes to surrender the Certificate and Certification Badges to the AGA upon request.



Reviewing Officer

Certificate Authorised

Certificate first issued: **28 March 2011**

Certificate No: **7747**

This copy valid from: **9 August 2011**

Refer specification issue: **02**

QF711/10

APPENDIX 6

VISION® COMMISSIONING CHECKLIST

Commissioning Checklist for Ambirad VS Heaters

(Seperate form to be completed for EACH heater)

School Name & Address:			
Burner Model:		Serial #	
No	Item	Done	Comments
INSTALLATION			
1	Check hanging of heater * Rods / Chains * Connections Secure		
2	Ensure heater is mounted inclined with U-bend 10-20mm lower than burner end		
3	Check burner and fan secure		
4	Check U bend secure		
5	Ensure electrical Isolating switch and cable are free with no tension. Cage should not be touching burner pipes, fan or flue.		
6	Ensure gas connection has isolating valve. No tension in hose and not touching cage.		
START-UP			
7	Check thermostat calling for heat (if fitted)		
8	Isolate smoke / fire alarms if installed. Heaters may smoke for 1 hour on initial start-up		
9	Check incoming gas supply pressure at heater inlet NG 1 to 2.5 kPa Nominal 1.13 kPa LPG 2.5 to 5.0 kPa Nominal 2.75 kPa		GAS TYPE =
10	Turn on electrical supply - check red neon illuminates and heater and fan start		
11	Check burner setting pressure (KpA) on outlet of heater regulator VS15 VS25 VS35 NG 0.75 0.8 0.8 LPG 2.0 1.08 2.24		
12	Check operation of flame failure by isolating gas		
13	Check operation of air pressure switch by isolating fan		
14	Re-connect smoke / fire alarms		
Commissioned by:		Date:	